

Nos. 2015-1171, -1195

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**UNITED STATES COURT OF APPEALS  
FOR THE FEDERAL CIRCUIT**

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APPLE INC., a California corporation,

*Plaintiff-Cross-Appellant,*

v.

SAMSUNG ELECTRONICS CO., LTD., a Korean corporation, SAMSUNG ELECTRONICS  
AMERICA, INC., a New York corporation, AND SAMSUNG TELECOMMUNICATIONS  
AMERICA, LLC, a Delaware limited liability company,

*Defendants-Appellants.*

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Appeals from the United States District Court for the Northern District of  
California in Case No. 12-cv-00630, Judge Lucy H. Koh.

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**NON-CONFIDENTIAL BRIEF FOR  
PLAINTIFF-CROSS APPELLANT APPLE INC.**

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## **CERTIFICATE OF INTEREST**

Counsel for Plaintiff/Cross-Appellant Apple Inc. certifies the following:

1. The full name of every party or amicus represented by us is:

Apple Inc.

2. The names of the real party in interest represented by us is:

Not applicable.

3. All parent corporations and any publicly held companies that own 10 percent or more of the stock of the party or amicus curiae represented by me are:

None.

4. The names of all law firms and the partners or associates that appeared for the party or amicus now represented by me in the trial court or agency or are expected to appear in this court are:

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**CONFIDENTIAL MATERIAL OMITTED**

The material omitted from pages 21, 44, and 45 of this non-confidential brief contains confidential technical information concerning Samsung’s products. The material omitted from pages 57, 58, and 59 of this non-confidential brief concerns the confidential terms of an Apple licensing agreement and confidential statements from the parties’ damages documents. The material omitted from pages 75 and 76 of this non-confidential brief contains confidential technical information concerning Apple’s products. This material has been designated confidential pursuant to a protective order and/or filed under seal in the United States District Court for the Northern District of California.

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## **STATEMENT OF RELATED CASES**

This Court previously resolved an appeal in this case arising from the district court's grant of a preliminary injunction. *Apple Inc. v. Samsung Elecs. Co.*, No. 2012-1507, 695 F.3d 1370 (Fed. Cir. 2012) (Prost, J., joined by Moore & Reyna, JJ.). Apple's appeal from the district court's denial of a permanent injunction in this case is currently pending before this Court. *Apple Inc. v. Samsung Elecs. Co.*, No. 2014-1802 (Prost, C.J. and Moore & Reyna, JJ.). Counsel for Apple are unaware of any other case pending in this or any other court that will directly affect or be directly affected by this Court's decision in the pending appeal.

## **JURISDICTIONAL STATEMENT**

The district court had jurisdiction under 28 U.S.C. §§1331, 1338. Samsung and Apple timely appealed. A41065-66; A41151-52. This Court has jurisdiction under 28 U.S.C. §1295(a)(1).

## **INTRODUCTION**

After thirteen days of trial, a jury found that Samsung infringed multiple Apple patents over thirty-five million times, and awarded Apple damages of \$119,625,000. The district court ruled that the jury's findings against Samsung were supported by substantial evidence and, after denying Apple's injunction request, ordered ongoing royalties for Samsung's continuing infringement.

Samsung does not challenge the jury's damages award, but appeals nearly every other aspect of the judgment against it. Samsung's primary challenge involves Apple's '647 patent, regarding which Samsung contends that Apple supposedly "presented its case based on claim constructions ... that this Court expressly rejected." Br. 1. But the district court used this Court's constructions from *Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286 (Fed. Cir. 2014) ("*Motorola*"), and Apple's expert explained how Samsung's products infringe under those constructions. Substantial evidence supports the infringement verdict.

For the other patents, Samsung raises a host of arguments that failed below. Samsung identifies no legal or evidentiary basis to overturn the infringement judgment for Apple's '172 patent, or the validity judgments for Apple's '721, '172, '959, and '414 patents. Samsung's complaints about the ongoing royalties order and evidentiary rulings do not show an abuse of discretion. And Samsung identifies no error in the district court's claim construction for Samsung's '239 patent, which followed this Court's means-plus-function precedent.

The district court did err in limited respects that warrant correction on Apple's cross-appeal. First, the non-infringement judgments for Apple's '959 and '414 patents should be reversed, as Samsung disputed only a *single* claim element for each patent and the undisputed evidence showed that Samsung's products satisfied each. Second, the court made a *legal* error in setting aside the jury's

willfulness finding for the '721 patent by concluding that Samsung's defense was "objectively reasonable," even though Samsung did not contest infringement for some products and its only invalidity argument turned on prior art that taught away from the claimed invention. Finally, given Samsung's inability to show that Apple's products practiced *three* separate limitations of Samsung's '449 patent, the infringement judgment for that patent should be reversed and the resulting \$158,400 damages award vacated.

## **STATEMENT OF ISSUES**

### **A. Apple's Patents**

1. '647 patent: whether substantial evidence supports the jury's infringement verdict.
2. '721 patent: whether the district court correctly concluded, and substantial evidence supports the jury's underlying findings, that claim 8 is not obvious; and on cross-appeal, whether the jury's willfulness verdict should be reinstated where Samsung's defense was not objectively reasonable.
3. '172 patent: whether the district court correctly construed "keyboard"; and whether the court correctly concluded, and substantial evidence supports the jury's underlying findings, that claim 18 is not obvious.
4. '959 patent: whether the district court correctly concluded that claim 25 is not indefinite; whether substantial evidence supports the jury's finding that

claim 25 is not anticipated; and on cross-appeal, whether the jury's finding that Samsung did not infringe is unsupported by substantial evidence.

5. '414 patent: whether substantial evidence supports the jury's finding that claim 20 is not anticipated; and on cross-appeal, whether the jury's finding that Samsung did not infringe is unsupported by substantial evidence.

6. Whether—after denying Apple injunctive relief—the district court acted within its discretion by ordering ongoing royalties for Samsung's continuing infringement.

7. Whether the district court's evidentiary rulings were within its discretion.

**B. Samsung's Patents**

8. '239 patent: whether the district court correctly construed "means for transmission."

9. '449 patent: on cross-appeal, whether the jury's finding that Apple infringed is unsupported by substantial evidence.

**STATEMENT OF CASE**

**A. Apple's Patents**

Apple has invested billions of dollars and years of research to create some of the most innovative and successful products in the world, including its revolutionary iPhones and iPads. A10424-26; A10450-54; A10585-98. Apple's



groundbreaking work is protected by many patents, including the five asserted here.

U.S. Patent No. 5,946,647 (“’647 patent”) covers Apple’s “Quick Links” feature. Asserted claim 9 covers a system that detects “structures” (e.g., phone numbers, email addresses) in text such as email messages and webpages, generates “links” to specific actions that can be performed for each type of detected structure (e.g., dialing a phone number, composing an email), and provides a “pop-up menu” allowing the user to select a linked action. A597; A10830-35. Apple implements the ’647 invention in its iPhones and iPads through its “data detectors” software. A10792-94.

U.S. Patent No. 8,046,721 (“’721 patent”) is directed to Apple’s iconic “Slide-to-Lock” feature. Asserted claim 8 recites a touchscreen device that unlocks when the user makes contact with an “unlock image” and continuously moves that image to a second, predefined location, while the device “display[s] visual cues to communicate [the] direction of movement of the unlock image required to unlock the device.” A685. Apple invented this feature during development of the original iPhone and still practices it today. A10602-03; A10636-38.

U.S. Patent No. 8,074,172 (“’172 patent”) describes an “Auto Correct” feature. Asserted claim 18 recites a graphical user interface that helps users type

more efficiently and accurately on a touchscreen device by suggesting word corrections that the user may select to replace misspelled words automatically. A707-08; A10693-95.

U.S. Patent No. 6,847,959 (“959 patent”) claims a “Universal Search” feature. Asserted claim 25 covers a system that allows users to input a single search into a device (e.g., a mobile phone), and the system uses “a plurality of heuristics” to locate results both stored locally on the device and from the Internet. A607; A10939-43.

U.S. Patent No. 7,761,414 (“414 patent”) covers a “Background Sync” feature. Asserted claim 20 discloses a system that allows data on two devices, such as a mobile phone and desktop computer, to be synchronized while user applications (e.g., email, calendar) run concurrently with the synchronization process. A655; A10968-71.<sup>1</sup>

## **B. Samsung’s Patents**

Samsung purchased U.S. Patent No. 5,579,239 (“239 patent”), which expired in February 2014, just before asserting it against Apple. A12525; A12734. Asserted claim 15 recites a device that includes a “video capture module” to

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<sup>1</sup> The district court permitted Apple to address only five claims at trial. A50074. Apple selected one claim from each of five patents. For the ’647 and ’721 patents, Apple showed that it practiced the same claims that Samsung infringed. A10636-38; A10792-94. If permitted to address additional claims, Apple would have shown that it also practices the ’172, ’959, and ’414 patents. A50179; A50189-90; A50194-200.

capture and compress video and “means for transmission” of the captured video over a cellular frequency. A720; A12735-36. Although Samsung describes the claimed invention as “a mobile phone” (Br. 56), the ’239 patent does not use that term and describes a “video capture” component that was commercially available in the prior art (A715(4:39-49)).

Samsung also purchased U.S. Patent No. 6,226,449 (“449 patent”) shortly before asserting it against Apple. A12685-86; A12770. Asserted claim 27 recites a “digital camera” containing “a compressor” that uses different compression methods for photos and videos and “a decompressor” that uses different decompression methods for photos and videos. A50765. It also requires a display that lists photos and videos as a “search mode” and a recording circuit that records each photo or video with “classification data.” A50765; A12769-71.

### **C. District Court Proceedings**

On summary judgment, the district court held that Samsung infringed the ’172 patent. A159-64; A13168. After a thirteen-day trial, a jury found that Apple’s asserted claims are not invalid and that Samsung infringed the ’647 patent and willfully infringed the ’721 patent. A40869; A40872-74. The jury also found that Samsung did not infringe the ’959 or ’414 patent. A40870-71. For Samsung’s over thirty-five million infringing sales, the jury awarded Apple damages of \$119,625,000. A40875-77.

For Samsung's patents, the jury found that Apple did not infringe the '239 patent, but did infringe the '449 patent. A40878. The jury awarded Samsung damages of \$158,400. A40879.

The district court granted JMOL that Samsung's infringement of Apple's '721 patent was not willful because "Samsung's invalidity defense was not objectively baseless," but did not disturb the jury's subjective willfulness finding. A63; A66.

The district court denied Apple's request for an injunction (A41023-24), which Apple raised in an interlocutory appeal. The district court ruled that Apple is entitled to supplemental damages, pre-judgment interest, and ongoing royalties. A3-38; A108-16. The court adopted methodologies for calculating those awards, but has not yet determined their amounts. A38; A109-10; A115-16.

### **SUMMARY OF ARGUMENT**

1. For Apple's '647 patent, the infringement judgment should be affirmed. The district court instructed the jury to apply this Court's *Motorola* constructions. Under those constructions, Apple's expert explained that code from shared libraries in Samsung's products is an "analyzer server" separate from the Browser and Messenger client applications, and "link[s] actions to the detected structures" by creating a specified connection between each detected structure and

the startActivity() subroutine. Substantial evidence supports the infringement verdict.

2. For Apple's '721 patent, the validity judgment should be affirmed. Substantial evidence supports the jury's findings that a skilled artisan would not have been motivated to combine Neonode and Plaisant, that the prior art taught away from Apple's "slide-to-unlock" invention, and that objective factors indicate non-obviousness. On cross-appeal, the JMOL of no willfulness should be reversed because Samsung's defense was not objectively reasonable.

3. For Apple's '172 patent, the infringement and validity judgments should be affirmed. The district court properly construed "a keyboard and a touch screen display" to include virtual keyboards, which Samsung's products undisputedly include. Substantial evidence supports the jury's findings that Robinson failed to disclose several claim limitations, that Xrgomics did not fill those gaps, and that objective factors indicate non-obviousness.

4. For Apple's '959 patent, the validity judgment should be affirmed. The district court correctly rejected Samsung's indefiniteness argument. The parties agreed that a "heuristic" is a rule of thumb, and Samsung's expert conceded that a skilled artisan could identify the claimed "heuristics." Substantial evidence supports the jury's finding that the WAIS source code, which is not prior art, does not anticipate claim 25. On cross-appeal, the non-infringement judgment should

be reversed, because Samsung's products undisputedly use "a plurality of heuristics" to locate information from places including "the Internet"—the only limitation Samsung challenged.

5. For Apple's '414 patent, the validity judgment should be affirmed. Substantial evidence supports the jury's finding that Windows Mobile 5 does not contain any synchronization software component that both is configured to synchronize data for a particular data class and provides a synchronization processing thread. On cross-appeal, the non-infringement judgment should be reversed, because Samsung's products unquestionably contain a third synchronization software component "configured to synchronize" structured data—the only limitation Samsung challenged.

6. The district court had jurisdiction to award ongoing royalties, and did not abuse its discretion by rejecting Samsung's waiver argument or by not discussing the HTC agreement in its order.

7. The district court did not abuse its discretion by allowing testimony concerning Apple's survey evidence, by excluding irrelevant evidence from other litigations, or by admitting evidence of lost profits for a "blackout" period.

8. For Samsung's '239 patent, the non-infringement judgment should be affirmed. The district court correctly construed "means for transmission," by identifying as corresponding structure the hardware and software that the

specification describes as performing the recited transmission function. Samsung has shown no error or prejudice from that construction.

9. For Samsung's '449 patent, the infringement judgment should be reversed. No reasonable jury could have found that Apple's products include "a compressor" (or "a decompressor") that uses different compression (or decompression) methods for photos and videos, as Apple's chip undisputedly contains two separate compressors (and two separate "decompressors") for photos and videos. Nor could the jury reasonably have found that Apple's Camera Roll includes the claimed "search mode," given that it uses the same prior art feature the inventors claimed to overcome. Finally, there was no evidence that Apple's products "record[]" each image "with classification data."

### **STANDARD OF REVIEW**

This Court reviews summary judgment and JMOL rulings *de novo*. *CollegeNet, Inc. v. ApplyYourself, Inc.*, 418 F.3d 1225, 1230 (Fed. Cir. 2005) (discussing Ninth Circuit law). A jury's verdict can be overturned only if "the evidence, construed in the light most favorable to the non-moving party, permits only one reasonable conclusion, and that conclusion is contrary to the jury's.'" *Id.* (citation omitted).

Claim construction and indefiniteness are legal issues reviewed *de novo* with underlying factual findings reviewed for clear error. *Teva Pharms., USA, Inc. v.*

*Sandoz, Inc.*, 135 S. Ct. 831, 841 (2015). Anticipation is a factual question reviewed for substantial evidence. *SynQor, Inc. v. Artesyn Techs., Inc.*, 709 F.3d 1365, 1373 (Fed. Cir. 2013). Obviousness is a legal question reviewed *de novo* with the jury's underlying factual findings reviewed for substantial evidence. *Id.*

Infringement is a factual question reviewed for substantial evidence. *Warsaw Orthopedic, Inc. v. NuVasive, Inc.*, 778 F.3d 1365, 1369 (Fed. Cir. 2015). Objective willfulness is reviewed *de novo*, while a jury's finding of subjective willfulness is reviewed for substantial evidence. *Bard Peripheral Vascular, Inc. v. W.L. Gore & Assocs., Inc.*, 682 F.3d 1003, 1006-1008 (Fed. Cir. 2012).

An ongoing royalty award is reviewed for abuse of discretion, as are evidentiary rulings. *Id.* at 1005 n.1; *Advanced Cardiovascular Sys., Inc. v. Medtronic, Inc.*, 265 F.3d 1294, 1307-1308 (Fed. Cir. 2001) (applying Ninth Circuit law).

Jurisdiction is a legal question reviewed *de novo*. *In re Cambridge Biotech Corp.*, 186 F.3d 1356, 1368 (Fed. Cir. 1999).

## **ARGUMENT**

### **I. THE INFRINGEMENT JUDGMENT FOR APPLE'S '647 PATENT SHOULD BE AFFIRMED.**

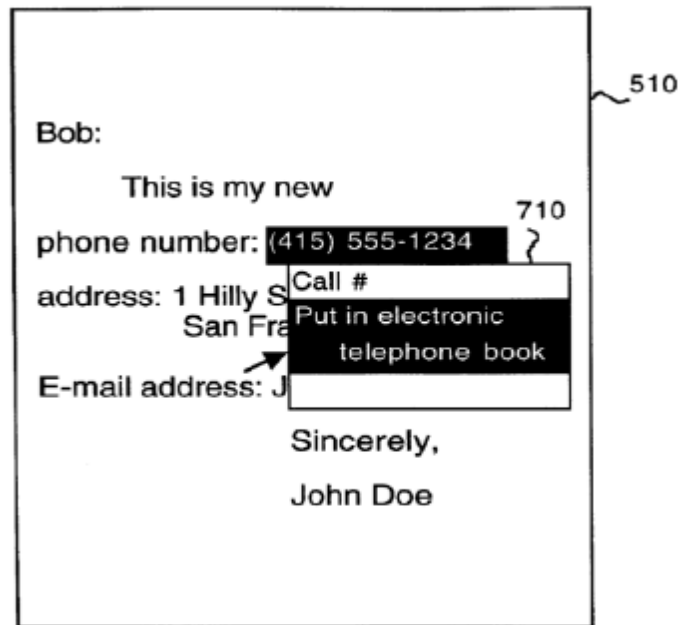
#### **A. Apple's '647 Patent**

Computer data often contains different types of “structures” (e.g., phone numbers, email addresses) that users may want to use to perform specific functions



(e.g., dial a phone number, compose an email). A594; A10829-32. Manually identifying and using that information can be “tedious and disruptive,” because it requires locating the information and copying or manually entering it into another program. A594; A10829-31. The '647 invention automatically detects different types of structures within text and generates links to specific actions that can be performed for each type of detected structure.

For example, Figure 7 shows an email containing a phone number:



A590. The system automatically detects that “(415) 555-1234” is a phone number and prompts the user to select from a pop-up menu of options: dial the number (“Call #”) or store it (“Put in electronic telephone book”). A594-97; A10832-35.

Claim 1, from which asserted claim 9 depends, recites “[a] computer-based system for detecting structures in data and performing actions on detected structures” that includes:

an *analyzer server* for detecting structures in the data,  
and for *linking actions to the detected structures*.

A597.<sup>2</sup>

### **B. Samsung’s Infringing Smartphones**

Apple accused nine Samsung smartphone models of infringing claim 9 through their web browser (“Browser”) and text messaging (“Messenger”) applications. A10836; A10844-46. As Apple’s expert Todd Mowry explained, both applications send data to an “analyzer server” that detects structures and links them to specified actions. A13030-35; A13039-40; *see* A10853-64; A41153; A50864-68; A51503.

Neither party sought construction of “analyzer server” or “linking actions to the detected structures” during *Markman*. A42. On the last scheduled day of trial testimony, however, this Court issued its *Motorola* decision, which construed “analyzer server” in the ’647 patent to mean “a server routine separate from a client that receives data having structures from the client,” 757 F.3d at 1304, and construed “linking actions to the detected structures” to mean “creating a specified connection between each detected structure and at least one computer subroutine

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<sup>2</sup> Emphases are added unless otherwise indicated.

that causes the CPU to perform a sequence of operations on that detected structure,” *id.* at 1305-1306 (emphasis omitted).

Following the *Motorola* decision, the district court allowed the parties to recall their experts. A43. During his recall testimony, Dr. Mowry explained how Samsung’s smartphones satisfy the “analyzer server” and “linking actions” limitations as construed in *Motorola*. A13029-45. The district court instructed the jury to apply this Court’s *Motorola* constructions. A13027; A13172-73.

The jury found that all nine Samsung smartphones infringed claim 9. A40869. The district court denied Samsung’s JMOL request. A46-47.

**C. Substantial Evidence Supports The Jury’s Finding That Samsung’s Products Include An “Analyzer Server.”**

Apple provided ample evidence from which the jury reasonably found that Samsung’s smartphones include an “analyzer server,” which this Court and the district court construed as “a server routine separate from a client that receives data having structures from the client.” *Motorola*, 757 F.3d at 1304; A13172.

Based upon his review of Samsung’s source code (A13044-45), Dr. Mowry testified that the Browser and Messenger applications are “clients” and identified code in certain shared libraries as the separate “server routines.” A13030-35; *see* A41153; A50865; A50867-68. He also explained how the shared libraries code receives data having structures from the Browser and Messenger client

applications. A13030-36; A13039-40; *see* A10853-64; A41153; A50864-68; A51503.

Samsung concedes that the shared libraries code that Dr. Mowry identified “perform[s] the detecting and linking functions” described in the ’647 patent (Br. 17-18); it disputes only whether that code is “separate from” the Browser and Messenger applications (Br. 18-25). But as Dr. Mowry testified, it is “*definitely separate* from the applications.” A13036. The shared libraries code is “developed independently of” the Browser and Messenger applications, stored “in a different part of the [memory] address space,” and “designed to be reused across different applications.” A13035-37. Dr. Mowry further described how only a single copy of the code for each shared library exists for use by Browser, Messenger, and other applications. A13035-36. Those applications use the shared libraries code “without actually duplicating the code”; each application “goes to the code where it is and uses it there, and it does that each time that it accesses the code.” A13037. Dr. Mowry’s testimony is substantial evidence supporting the jury’s infringement verdict.

Samsung contends that “Apple tried its entire case” under the wrong claim construction. Br. 1, 19-20. That is simply not true. After *Motorola* issued, Dr.

Mowry provided further testimony under this Court's construction, and the jury was given that same construction. A13027; A13172.<sup>3</sup>

Samsung also asserts that "uncontested evidence" showed that the shared libraries code is part of the Browser and Messenger applications because those "applications merely copy [the] code from a library for later use." Br. 18-19. Samsung relies on its own witnesses, Google engineer Dianne Hackborn and expert Kevin Jeffay, but the jury was entitled to reject their testimony (which was contested) and to credit Dr. Mowry's explanation instead:

Q. Now, do you recall that Dr. Jeffay gave some testimony that each application has its own copy of the shared libraries?

A. Yes.

Q. Is that correct?

A. No, that's not correct.

Q. What actually happens when the code is running on the Samsung phones if an application, for example, like Messaging, needs to use the code from one of these shared libraries?

A. Well, it has access to the code and *it goes to the code where it is and uses it there*, and it does that each time that it accesses the code.

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<sup>3</sup> Samsung incorrectly asserts that Dr. Mowry "stated that his analysis had not changed" after *Motorola*. Br. 20. He said that his *opinion that Samsung infringes* had not changed and that he based that opinion on the same code he had previously addressed. A13029; A13039.

A13036-37; *see* A13035; A13052-54; A13064.<sup>4</sup> Samsung at most shows conflicting expert testimony, which the jury was free to resolve in Apple's favor. *See Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1362 (Fed. Cir. 2012).

Samsung next suggests that the shared libraries code that Dr. Mowry identified is not “a server separate from a set of client applications that can access it” because “a shared library and a server are distinct concepts.” Br. 21. This artificial distinction again relies on the incorrect premise that the shared libraries code is “copie[d]” and “integrat[ed] ... into the application itself” (Br. 21), which Dr. Mowry refuted based upon his examination of the code. *See supra* pp. 15-17. Dr. Mowry's testimony that the shared libraries are available for use by many different applications (“clients”) also demonstrates that the shared libraries contain the separate server routines of the “analyzer server.” A13035. And consistent with “basic principles of computer science” (Br. 23), Dr. Mowry explained why Samsung's smartphones are designed this way: they conserve storage space by avoiding duplicative code in each application. A13037.

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<sup>4</sup> Contrary to Samsung's assertions, Ms. Hackborn did not testify that applications “copy” code from the shared libraries. Br. 18-19 (citing A11591-92). Regardless, Dr. Mowry made clear that Ms. Hackborn's testimony did not alter his opinion regarding how the shared libraries code is used. A13038.

Samsung’s contention that the shared libraries “never *receive* data from a client application” (Br. 21 (emphasis in original)) is just another variation on its argument that the shared libraries code runs as part of the Browser and Messenger applications, which Dr. Mowry explained is not the case. A13064 (“Shared libraries don’t run as part of an application.”); *see supra* pp. 15-18. In any event, Dr. Mowry testified that the shared libraries “receive data from the Messenger and Browser applications,” as the district court recognized. A47 (citing A13030-32; A13034-35).<sup>5</sup>

Finally, Samsung claims that Dr. Mowry’s reference to “code in the client” and “code from the client” suggests that he relied upon code that is not “separate from” the Browser and Messenger applications. Br. 22, 25 (citing A13033:8-11; A13033:19-21; A13034:16-19). Samsung takes Dr. Mowry’s statements out of context: When he referred to “code in / from the client,” Dr. Mowry was not describing the server routines that form the “analyzer server,” but was describing distinct “glue code” that connects the Browser and Messenger applications (“clients”) to the analyzer server. A13033-34 (separately identifying “server routines” and “glue code”); A13034 (describing “glue code” as “software that

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<sup>5</sup> Samsung quibbles with Dr. Mowry’s testimony that “the routines” receive data (Br. 23), but that is precisely what this Court’s claim construction requires—“*a server routine* separate from a client *that receives data* having structures from the client.” *Motorola*, 757 F.3d at 1304.

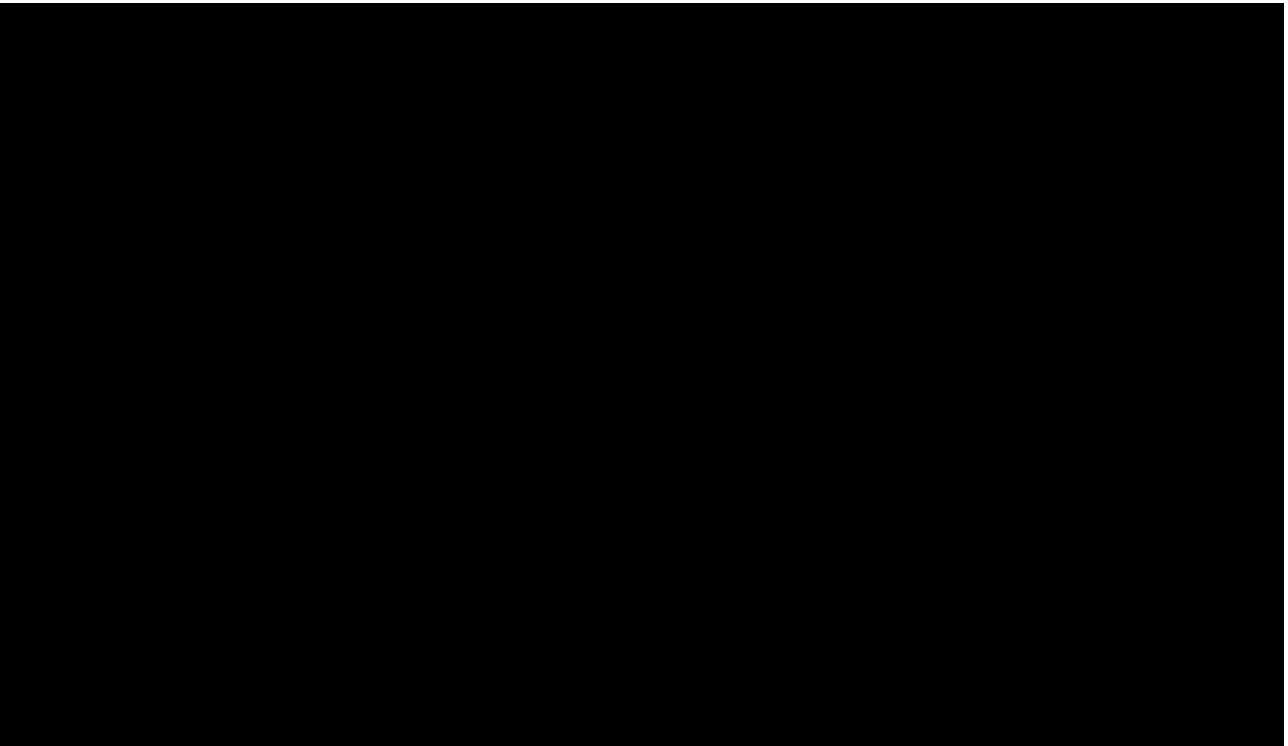
connects together different modules or different pieces of software”). That glue code confirms the client-server relationship required by the ’647 patent, since such code is necessary “to communicate with the server.” A13034.

**D. Substantial Evidence Supports The Jury’s Finding That Samsung’s Products “Link[] Actions To The Detected Structures.”**

Apple also offered substantial evidence regarding the specific components of Samsung’s code responsible for “linking actions to the detected structures,” which this Court and the district court construed to mean “creating a specified connection between each detected structure and at least one computer subroutine that causes the CPU to perform a sequence of operations on that detected structure.” *Motorola*, 757 F.3d at 1305-1306 (emphasis omitted); A13172-73.

Dr. Mowry testified that Samsung’s smartphones create a “specified connection” between a detected structure and a computer subroutine that causes the processor to perform certain operations on the structure. A13039-41. For example, as shown below for a detected phone number, he explained how the code creates a “specified connection” by generating an “Intent object” for a particular linked action (e.g., “Dial”) shown in the pop-up menu, which is passed to the computer subroutine “startActivity()”:





A50868; A13040-41; *see* A10857-61; A10863-64; A50865.

As Dr. Mowry explained, the `startActivity()` code uses the “data field” and “action field” in the Intent object to determine which *specific actions* should be taken for the detected structure (e.g., open the dialer and populate the phone number field), and the `startActivity()` code causes the processor to perform those operations on the detected structure. A13042-43; *see* A10857-61; A10863-64; A51503. Thus, the jury reasonably found that Samsung’s smartphones satisfy the “linking actions” limitation as this Court construed it.

Nonetheless, Samsung contends that calling the `startActivity()` code does not create a “specified connection” because it was “undisputed” that `startActivity()` “is simply the code that begins the process of searching for an unknown application.”

Br. 31. But that is incorrect and certainly not “undisputed.” As Dr. Mowry explained, when an Intent object calls `startActivity()`, the data and action fields in the Intent object indicate exactly which actions the processor should perform on the detected structure: “you get different behaviors from [`startActivity()`] based on how you fill in the fields in the Intent object.” A13042-43.

Samsung points to Dr. Mowry’s statement that `startActivity()` is a “launcher ... that knows how to launch another program” to suggest he “conceded” that `startActivity()` performs only a generic function. Br. 31 (quoting A10858). But Samsung ignores Dr. Mowry’s full explanation that, in the context of a particular Intent object, `startActivity()` causes the processor to perform a *specific* sequence of operations on the detected structure. A13042-43. Dr. Mowry provided examples showing that `startActivity()` will cause *different* operations to be performed for *different* Intent objects. A13042-43 (providing examples of operations for dialing a phone number compared to operations for adding a phone number to Contacts).

Samsung next argues that “unrebutted” evidence established that an Intent object creates only an “association” rather than a “specified connection,” because the Intent object does not decide which program to use. Br. 27. But Apple did not accuse the Intent object of satisfying the “linking” limitation on its own; rather, as Dr. Mowry explained, it is *startActivity()* that joins a detected structure to a specific action using the information the Intent object provides. A13043. That

joining of a detected structure to an action performed by the processor is precisely the “specified connection” that *Motorola* requires. 757 F.3d at 1306 (“[L]inking infers a joining.”).

Samsung also appears to contend that a “specified connection” cannot exist between the detected structure and `startActivity()` because `startActivity()` is not “the code for performing a selected action” (e.g., the program that dials the phone). Br. 29. But *Motorola* requires a “specified connection” to a “computer subroutine that *causes* the CPU to perform a sequence of operations on that detected structure,” not one that *actually* performs the sequence of operations itself. 757 F.3d at 1305. Contrary to Samsung’s suggestion (Br. 31), this does not mean that the “specified connection” requirement is satisfied “any time that a user chooses an action.” Rather, there must still be a “specified connection” created by an “analyzer server” between “each detected structure” and a computer subroutine that “causes the CPU to perform a sequence of operations on the detected structure”—just as `startActivity()` does in Samsung’s smartphones. A13042-43. Indeed, even Samsung’s expert admitted that `startActivity()` “is the computer subroutine that’s actually linked into the detected structures.” A13103.

Finally, Samsung argues that the “specified connection” between the detected structure and the computer subroutine “must exist before the user selects the action” (Br. 32-33), but the claim contains no such timing requirement. The

claim simply requires components that perform certain functions: “an analyzer server ... for linking actions to the detected structures” and “a user interface enabling the selection of a detected structure and a linked action.” A597. Nor does this Court’s claim construction impose a timing requirement. *Motorola*, 757 F.3d at 1305-1306.<sup>6</sup>

Even if Samsung could manufacture its desired timing requirement, the jury reasonably could have found that limitation satisfied on this record. Dr. Mowry emphasized that `startActivity()` is “necessarily” called when a user selects an action from the pop-up menu, indicating that the “specified connection” between the detected structure and `startActivity()` exists when the user makes a selection. A13040 (“If the user picks that particular option, it will necessarily call `startActivity()` and pass that Intent object as the input to `startActivity()`.”); A13041. Samsung’s expert Dr. Jeffay admitted that “`startActivity()` is the computer subroutine that’s *actually linked* into the detected structures.” A13103. Samsung’s argument that no connection exists until after the user makes a selection impermissibly draws inferences against the jury’s verdict. *See Harper v. City of L.A.*, 533 F.3d 1010, 1021 (9th Cir. 2008).

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<sup>6</sup> Samsung waived any request to rewrite the *Motorola* construction to impose a timing requirement by failing to raise it before the jury verdict. *See Broadcom Corp. v. Qualcomm Inc.*, 543 F.3d 683, 694 (Fed. Cir. 2008).

## **II. THE VALIDITY JUDGMENT FOR APPLE'S '721 PATENT SHOULD BE AFFIRMED AND THE JURY'S WILLFULNESS VERDICT REINSTATED.**

Apple's '721 patent discloses a user-friendly solution to the problem of accidental activation of mobile touchscreen devices (e.g., “pocket dialing”). A10601-02; A10638. Asserted claim 8 requires a portable touchscreen device that may be unlocked by making contact “at a first predefined location corresponding to an unlock image,” “continuously mov[ing] the unlock image ... in accordance with movement of the detected contact,” and “unlock[ing] the hand-held electronic device if the unlock image is moved ... to a predefined unlock region.” A685. The device “display[s] visual cues to communicate [the] direction of movement of the unlock image required to unlock the device.” A685.

Apple practices claim 8 through its iconic “slide-to-unlock” feature, shown below:



A50845-48; *see* A10602-03; A10636-38.

**A. The Jury And The District Court Correctly Concluded That Claim 8 Is Not Obvious.**

Samsung's only invalidity theory at trial was obviousness based on Neonode and Plaisant, even though the Patent Office considered the subject matter of both during prosecution of the '721 patent.<sup>7</sup> The evidence amply supports the jury's verdict and the district court's conclusion that Samsung failed to prove obviousness by clear and convincing evidence.

For Neonode, Samsung's expert conceded that "there is no image on the Neonode phone." A11976-77. Neonode therefore does not disclose *any* of claim 8's elements concerning the unlock image or its movement, including a "predefined location corresponding to an unlock image," "continuous movement of an unlock image," "unlocking the device if the image is moved from one location to another," and "visual cues communicating the direction of movement." A12875-76.

Substantial evidence supports the jury's finding that a skilled artisan would not have looked to Plaisant for the missing elements. Whereas Neonode describes a mobile phone (A12875; A20713-40), Plaisant describes a wall-mounted device to

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<sup>7</sup> The Patent Office considered a version of Neonode called "Welcome to the N1 Guide" (A659), which Samsung's expert conceded contained "the same information" as the version considered by the jury (A11984).

For Plaisant, Samsung relies on a paper and accompanying video. A20741-43. The Patent Office considered at least the paper (A659), and as Samsung's expert acknowledged, the paper and video "are one single reference" (A12004-05).

control home appliances like air conditioning units and heaters (A12876; A20741-43), which a skilled artisan would not naturally turn to for solving the “pocket dialing” problem. *Apple Inc. v. Samsung Elecs. Co.*, 877 F. Supp. 2d 838, 887-888 (N.D. Cal. 2012), *rev’d on other grounds*, 695 F.3d 1370 (Fed. Cir. 2012).

Moreover, as Apple’s expert Andrew Cockburn explained, Plaisant taught away from the ’721 patent by criticizing sliding mechanisms and “tell[ing] you not to use the sliding mechanism.” A12877; *see* A12876 (“The publication itself and the video that accompanies it both teach away from the use of sliding.”); A20743 (Plaisant stating that “sliders were not preferred,” that “sliding is a more complex task,” and that “sliders are more difficult to implement”).

The district court thus correctly concluded that “the jury’s implied finding of fact that there would have been no motivation to combine the Neonode and Plaisant was supported by substantial evidence.” A56; *see Kinetic Concepts*, 688 F.3d at 1362 (a reference teaches away if a skilled artisan ““would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant”” (citation omitted)); *Spectralytics, Inc. v. Cordis Corp.*, 649 F.3d 1336, 1343-1344 (Fed. Cir. 2011) (affirming non-obviousness where “the jury could find, based on the expert testimony, that prior [art] machines taught away”).

Samsung asserts that Plaisant did not “discourage” sliders, but was merely “ambivalen[t]” toward them. Br. 35-36. Unlike Samsung’s cited case, where this Court held that “silence does not imply teaching away,” *Allergan, Inc. v. Apotex Inc.*, 754 F.3d 952, 964 (Fed. Cir. 2014), Plaisant was neither “silen[t]” nor “ambivalen[t].” Rather, as noted above (p. 27), it explicitly **criticized** the type of sliding feature claimed in the ’721 patent. And even if Samsung could generate a factual dispute regarding Plaisant’s teachings, “[w]hether the prior art teaches away from the claimed invention is a question of fact” regarding which the jury’s verdict deserves deference. *Spectralytics*, 649 F.3d at 1343-1344.

As the district court recognized (A56), the jury’s rejection of Samsung’s obviousness defense is also supported by objective indicia, including:

- ***Long-felt but unresolved need:*** Before Apple’s invention, phone designers tried for years to solve the accidental activation problem and only came up with “frustrat[ing]” methods. A10638-39.
- ***Industry praise / copying:*** Apple’s slide-to-unlock feature was met with cheers when it was unveiled. A12879-80. Samsung’s own documents also praised the feature and instructed Samsung’s engineers to copy it. *E.g.*, A51289 (recommending modifying Samsung’s design to “clarify the unlocking standard by sliding” and make it the “[s]ame as iPhone”); A51603 (praising iPhone’s slide-to-unlock feature as “intuitive[.]” and



directing Samsung to “improve[]” its phones by “[p]rovid[ing] a hint on the lock screen about the direction and length of touch” needed to unlock); A50950; A51028; A51084; A12878-80. Far from providing only “generic praise” (Br. 37), “these various Samsung documents recognized the advantages of claim 8” specifically, as Dr. Cockburn testified. A57 (citing A10640-52); *see Rambus Inc. v. Rea*, 731 F.3d 1248, 1256-1257 (Fed. Cir. 2013) (competitor’s praise of claimed functionality shows non-obviousness).

- ***Commercial success:*** Samsung’s expert admitted that “there’s no question that the Apple iPhone was a commercial success” (A11984), and survey evidence supplied a nexus to the claimed invention by showing that consumers were more willing to buy, and to pay more for, devices incorporating Apple’s slide-to-unlock feature (A21066; A21108).

The district court correctly deferred to the jury’s factual finding that objective indicia supported non-obviousness. *See Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, 711 F.3d 1348, 1369 (Fed. Cir. 2013).

**B. The Jury’s Willfulness Finding For The ’721 Patent Should Be Reinstated.**

The jury found that Samsung’s infringement of the ’721 patent was subjectively willful. A40874. That finding, which the district court did not disturb (A63), is supported by substantial evidence.

The jury saw numerous Samsung documents showing side-by-side comparisons of Samsung's unlocking mechanisms and Apple's slide-to-unlock feature—with explicit directions to copy the iPhone's feature. *See supra* pp. 28-29. Samsung deliberately copied Apple's slide-to-unlock feature even though it knew Apple had applied for numerous patents covering iPhone features and Samsung had previously been accused by Apple of copying the iPhone's software features. A51409-11; A51418; A51431; *see* A50690. Samsung continued to infringe the '721 patent even after Apple sued. A13199; A21115. This evidence amply supports the jury's willfulness finding. *See Liquid Dynamics Corp. v. Vaughan Co.*, 449 F.3d 1209, 1225-1226 (Fed. Cir. 2006).

Nonetheless, the district court ruled that Samsung's infringement was not willful because "Samsung's defense to infringement of claim 8 was not objectively baseless." A64. That conclusion, which this Court reviews *de novo* (*supra* p. 12), was erroneous. Samsung did not present **any** non-infringement defense at trial for two of its three infringing products,<sup>8</sup> or **any** evidence to suggest it had a good-faith belief that it was not infringing. A11988-89. And Samsung does not appeal the jury's infringement finding for any of the three infringing devices.

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<sup>8</sup> Samsung's only non-infringement defense for the third infringing device was its expert's conclusory testimony that an unlock image that changes appearance once the user makes contact does not infringe. A11988-89. That testimony was inconsistent with the claim language, *Apple*, 877 F. Supp. 2d at 883-885, and rebutted by Dr. Cockburn (A10678-79).

With respect to validity, Samsung maintained only one defense: obviousness based upon Neonode and Plaisant, and conclusory expert testimony that “a person ... would just think it natural to combine these two.” A11982. But this defense was just as unreasonable because: (1) the Patent Office considered the subject matter of those references (*supra* p. 26), one of which taught away from the claimed invention (*supra* pp. 27-28); (2) the district court had already concluded at the preliminary injunction stage that Samsung could “not provide[] sufficient evidence” that a skilled artisan would be motivated to use Plaisant’s “terminal from which large devices such as heaters and home security systems were connected and controlled ... to solve the unique problems of handheld devices such as cell phones,” *Apple*, 877 F. Supp. 2d at 887-888; and (3) Samsung itself was in possession of the best non-obviousness evidence: its own documents praising and recommending copying the iPhone’s slide-to-unlock feature (*supra* pp. 28-29).

A “reasonable litigant” could not “realistically expect” Samsung’s obviousness defense to succeed. *Bard*, 682 F.3d at 1008 (citation omitted). This Court should reinstate the jury’s willfulness finding and remand for a determination of enhanced damages. *See Aqua Shield v. Inter Pool Cover Team*, 774 F.3d 766, 773-774 (Fed. Cir. 2014) (vacating no willfulness determination where the court did not identify “any substantial basis ... for doubting

infringement or validity” and the patentee “presented *no* infringement defenses for [some] claims”).

### III. THE INFRINGEMENT AND VALIDITY JUDGMENTS FOR APPLE’S ’172 PATENT SHOULD BE AFFIRMED.

The ’172 patent discloses a method for correcting spelling errors on touchscreen devices by providing word correction recommendations and allowing the user to select the recommended word. A686. As shown in Figure 4D, when a user types a word (“cae” 222) in a first display area 214, a second display area 216 shows the typed word (“cae” 226) and a suggested replacement (“car” 224):

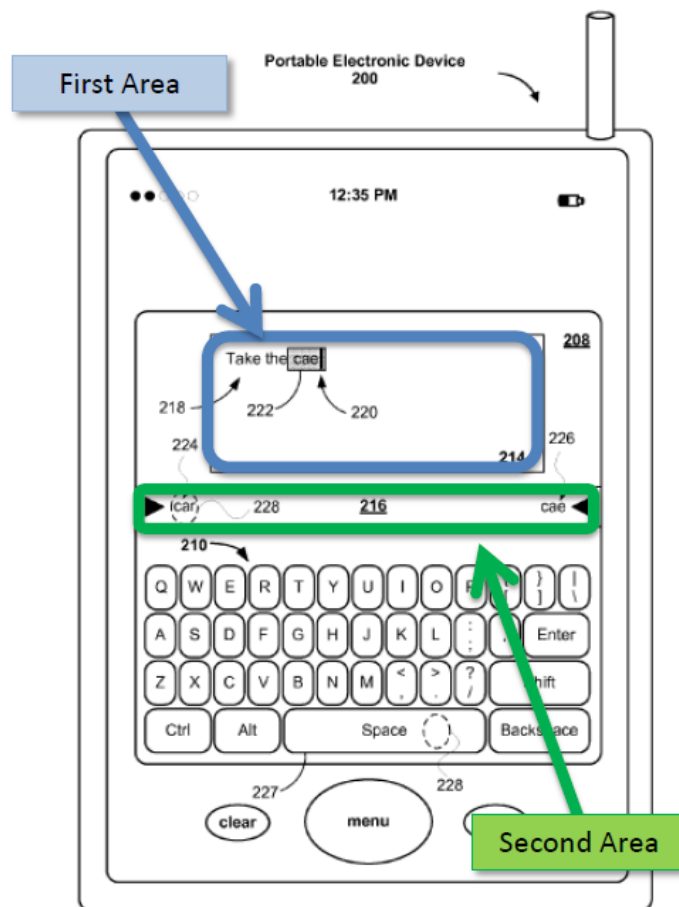


FIG. 4D

A694; A50822. If the user enters a delimiter (e.g., a space or punctuation mark) or selects the suggested word from the second area, the suggested word automatically replaces the typed word in the first area. A706(9:55-62). Alternatively, the user can keep the word as typed by selecting it from the second area. A706(9:28-34).

Asserted claim 18 recites “[a] graphical user interface on a portable electronic device with *a keyboard and a touch screen display*.” A707. It further describes a first area of the display, where the current (misspelled) word (or “character string”) is displayed, and a second area, where the current word and suggested replacement are both displayed. A707-08. The claim recites that if the user enters a delimiter or performs a gesture on the suggested word, the current word in the first display area is replaced by the suggested word; if the user performs a gesture on the current word in the second area, then that word is kept in the first area. A707-08.

**A. The District Court Correctly Granted Summary Judgment Of Infringement.**

The district court granted summary judgment of infringement because there was no factual dispute regarding the operation of Samsung’s accused devices (A160-61), and Samsung’s non-infringement argument depended entirely on construing “a keyboard *and* a touch screen display” to exclude virtual keyboards (Br. 38 (emphasis in original)). The district court correctly rejected that argument. A161-64.

Claim 18 recites “a keyboard and a touch screen display,” the plain meaning of which includes virtual keyboards. *E.g.*, A703(4:11-12) (referring to “keyboard embodiments displayed on a touch screen”). Also, claims 23 and 29 list separately “a display” and “a keyboard,” and specify that “the display is a touch screen display” and “the keyboard is a virtual keyboard.” A708-09. This alone refutes Samsung’s argument that a “keyboard” cannot be part of a “display” if listed separately. *See Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1342 (Fed. Cir. 2001) (“[A] claim term should be construed consistently with its appearance ... in other claims of the same patent.”).

Additionally, the inventors were explicit when excluding virtual keyboards. A707(claim 7) (“wherein the keyboard is a physical keyboard that is not part of the touch screen display”). No such restriction appears in claim 18, confirming that it encompasses virtual keyboards. *See Kara Tech. Inc. v. Stamps.com Inc.*, 582 F.3d 1341, 1347 (Fed. Cir. 2009) (“[W]hen the inventor wanted to restrict the claims to require the use of a key, he did so explicitly.”).

Samsung’s argument is also contradicted by the specification. Every figure shows a virtual keyboard (A689; A691-701), and nearly all disclosed embodiments include a virtual keyboard. *E.g.*, A703(4:11-33) (keyboard embodiments using “icons” or “soft keys”); A705(7:10-15) (“virtual or soft keyboard 210”); A705-

06(7:62-65, 9:5-8, 9:55-62) (“keyboard 210”). The one paragraph that mentions a physical keyboard describes it as an “[a]lternative[]” embodiment. A705(7:33-39).

Samsung’s two cases (Br. 38) are distinguishable. In *Becton, Dickinson & Co. v. Tyco Healthcare Group, LP*, 616 F.3d 1249 (Fed. Cir. 2010), the relevant claim required a “spring means” “connected to” a “hinged arm.” *Id.* at 1253-1254. The phrase “connected to” meant it was a “physical impossibility” for the “spring means” and “hinged arm” to be part of the same structure, and the specification disclosed *only* separate structures. *Id.* at 1254-1255. Here, nothing about claim 18 suggests the “physical impossibility” of a virtual keyboard, and the specification and other claims expressly envision its use with a touch screen display. *See Powell v. Home Depot U.S.A., Inc.*, 663 F.3d 1221, 1231-1232 (Fed. Cir. 2011) (distinguishing *Becton* where the specification “does not suggest that the claim terms require separate structures”). Nor does the specification “plainly describe[] the two components as separate” or suggest that “structural separation ... is essential to the operation of the device.” *Gaus v. Conair Corp.*, 363 F.3d 1284, 1288-1289 (Fed. Cir. 2004).

The district court properly construed claim 18 to encompass virtual keyboards. Because that construction leaves Samsung with no non-infringement argument, the summary judgment of infringement should be affirmed.

**B. The Jury And The District Court Correctly Concluded That Claim 18 Is Not Obvious.**

Samsung bases its invalidity argument on two references: Robinson and Xrgomics. Br. 39. The parties presented expert testimony on both references and objective indicia of non-obviousness. A12044; A12065-67; A12914-21. After the jury found claim 18 not invalid (A40874), the district court correctly denied JMOL (A69).

Apple's expert Dr. Cockburn demonstrated that Robinson fails to teach *several* of claim 18's limitations, including: displaying the current character string in the first area, replacing the current character string in the first area when the user presses a delimiter or selects a suggested replacement string, and keeping the current character string in the first area if the user performs a gesture on the current character string in the second area. A12914-16; A50935; *see* A12024 (Samsung's expert admitting Robinson does not disclose displaying the current character string in the first area). "[W]hether the prior art discloses the limitations of a particular claim is a question of fact to be determined by the jury," *Kinetic Concepts*, 688 F.3d at 1363, and the jury was entitled to accept Dr. Cockburn's testimony.<sup>9</sup>

Dr. Cockburn also explained that Xrgomics cannot fill the gaps left by Robinson. First, Xrgomics is not "another text *correction*" system (Br. 43); it is a

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<sup>9</sup> The Patent Office had every figure disclosed in Robinson before it during prosecution of the '172 patent, including the figure Samsung "modifies" (Br. 43). A12066-67; A12918-19.



text **completion** system that suggests alternatives for adding letters to complete a word as it is being typed, rather than suggesting words to replace or correct a word that has already been typed. A12916-17; A21000. Second, Xrgomics (like Robinson) does not disclose that “the current character string in the first area is replaced with the suggested replacement string when the user presses a delimiter.” A12916-17. Instead, Xrgomics teaches that, if the user presses the space bar, the original text is kept (i.e., the opposite of claim 18). A12917-18; A21025; A50936. From this testimony, the jury could reasonably find that Xrgomics did not disclose the several limitations missing from Robinson. *See Kinetic Concepts*, 688 F.3d at 1356-1357.

Samsung’s assertion that objective indicia are “inapplicable” to the ’172 patent (Br. 45 n.5) appears only in a footnote, without explanation or record citation, and is therefore waived. *See Otsuka Pharm. Co. v. Sandoz, Inc.*, 678 F.3d 1280, 1294 (Fed. Cir. 2012). Moreover, Samsung ignores Dr. Cockburn’s testimony that commercial success and industry praise from Samsung’s own documents supported non-obviousness. A12918. The jury saw an internal Samsung document specifically linking a customer request to improve user experience with the subject matter of claim 18. A51488 (describing alternative as “jarring” and suggesting replacement with claim 18’s functionality).

The jury was entitled to reject Samsung's expert's weak attempt to explain this evidence away (A12036-37 ("everything is best for someone and worst for someone else")), especially given his admission that Samsung's 7.5 million infringing sales evidenced commercial success. A12044. Apple also presented survey evidence showing a nexus between the '172 patent and the success of products that practice it over non-infringing alternatives. A51440. The record amply permitted the jury to find objective indicia supporting non-obviousness. *See Power Integrations*, 711 F.3d at 1369.

#### **IV. APPLE'S '959 PATENT IS NOT INDEFINITE OR ANTICIPATED, AND IS INFRINGED.**

Apple's '959 patent discloses a system of "universal search" whereby a user can input a single search request into a device, such as a mobile phone, and the system uses "a plurality of heuristics" to help the user find results both stored locally on the device and from the Internet. A607; A10940-41.

Claim 24, from which asserted claim 25 depends, recites "[a] computer readable medium for locating information from a plurality of locations containing program instructions" to, among other things: (1) "receive an information identifier"; (2) "provide said information identifier to *a plurality of heuristics* to locate information in the plurality of locations which *include the Internet* and local storage media"; and (3) "determine at least one candidate item of information based upon *the plurality of heuristics*." A607.

**A. The District Court Correctly Concluded That Claim 25 Is Not Indefinite.**

Contrary to Samsung's contention (Br. 46), the district court explicitly "addresse[d] Samsung's indefiniteness arguments under the intervening *Nautilus* decision" and, applying that standard, "determine[d] that Samsung has not shown by clear and convincing evidence that 'heuristic' is indefinite." A73. On appeal, Samsung offers only the same "conclusory allegations" that the district court properly rejected. A74.

The district court construed "heuristic" as a "'rule of thumb' that does not consist solely of constraint satisfaction parameters." A181.<sup>10</sup> Far from "labor[ing]" to do so (Br. 46), the court based that construction, and its construction of "heuristic algorithm" in Apple's related '604 patent, on the parties' "*agree[ment]*" that a heuristic is "a 'rule of thumb,'" dictionary definitions supporting that agreement, and statements in the '604 patent's prosecution history distinguishing heuristic algorithms from constraint satisfaction algorithms. *Apple*, 877 F. Supp. 2d at 865-866; *see* A181 ("Neither party contends that the Court should construe 'heuristic' [in Apple's '959 patent] differently [from 'heuristic algorithm' in Apple's '604 patent] in any substantive respect.").<sup>11</sup>

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<sup>10</sup> A "constraint satisfaction parameter" is based upon "'classical logic' in which constraints are 'algorithmically decidable.'" *Apple*, 877 F. Supp. 2d at 865.

<sup>11</sup> U.S. Patent No. 8,086,604 is a continuation of the '959 patent (A50001) and was the subject of Samsung's preliminary injunction appeal. In that appeal,

Samsung now calls this definition “imprecise.” Br. 46. But “[a]bsolute precision is unattainable.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014). The district court’s construction was sufficiently definite as confirmed, for example, by the ability of both parties’ experts to apply it without difficulty, as Samsung’s expert Martin Rinard did in his report:

[T]here are techniques that have been recognized, are generally recognized, or would generally be recognized by the computer scientists and one of skill in the art as ‘rules of thumb’ that do not consist solely of constraint satisfaction parameters and are therefore unambiguously heuristics. I have, in general, identified such techniques as heuristics during my anticipation and obviousness analysis.

A50095. Dr. Rinard did the same at trial, discussing how the WAIS source code “implement[s] a rule of thumb” and “absolutely satisfies her honor’s construction of heuristics.” A11923-24; A11926. Apple’s expert Alex Snoeren likewise identified “heuristics” in his infringement analysis, pointing out accused “code that actually explains how the rule of thumb works.” A10957; *see* A10956-59. Thus, the term clearly “inform[s], with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus*, 134 S. Ct. at 2124.<sup>12</sup>

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Samsung did not argue that the district court’s construction of “heuristic algorithm” rendered any claims indefinite, and this Court did not disturb that aspect of the construction. *See Apple*, 695 F.3d at 1378-1380.

<sup>12</sup> Dr. Snoeren did not “describe[] ‘heuristics’ as simply ‘good idea[s],’” as Samsung suggests. Br. 46-47 (quoting A10941) (emphasis omitted). He made that

Samsung relies on selected excerpts from inventor depositions. Br. 47. But one inventor testified that the term’s meaning “depends on the context” (A51972) and, as the district court observed, Samsung “did not ask the[se] witnesses to define or apply the term *in the context of the claims*.” A183-84. Regardless, “inventor testimony, obtained in the context of litigation, should not be used to invalidate issued claims under section 112, paragraph 2.” *Solomon v. Kimberly-Clark Corp.*, 216 F.3d 1372, 1380 (Fed. Cir. 2000). And to the extent the district court found Samsung’s reliance on the inventors’ testimony unpersuasive—particularly in light of the experts’ testimony—that was not clearly erroneous. *See Teva*, 135 S. Ct. at 841 (factual findings underlying indefiniteness reviewed for clear error).

**B. Substantial Evidence Supports The Jury’s Verdict That Claim 25 Is Not Anticipated.**

As the district court found, “the jury had multiple bases from which to conclude that Samsung failed to demonstrate with clear and convincing evidence that claim 25 was invalid.” A70. Substantial evidence supports the jury’s finding that WAIS does not anticipate claim 25.

Initially, as the district court concluded, “the jury could have reasonably determined that Samsung failed to show that WAIS qualified as prior art.” A72.

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statement in the context of explaining that a “rule of thumb” (part of the “heuristic” construction) is something that is not “perfect” or “optimal.” A10941.

Samsung's expert relied on the version of WAIS known as "freeWAIS-sf" (A11957), but "admitted that he did not know of any actual computers in the United States that ran freeWAIS-sf before the '959 patent's priority date." A71 (citing A11961). Similarly, WAIS developer Ulrich Pfeifer "equivocated as to whether freeWAIS-sf was available from servers in the United States" before the priority date. A71 (citing A11878).<sup>13</sup>

Without evidence of a system running freeWAIS-sf in the United States before 2000, Samsung relied on the *source code* alone. A11937 ("The prior art here is the software, the source code."); *see* A11922; A12927. But claim 25's preamble requires a "*computer readable medium ... containing program instructions* to" carry out the recited elements. A607. As Apple's expert Dr. Snoeren explained, source code is not a computer readable medium and does not contain computer-readable program instructions. A12835. Thus, the jury reasonably could have found that the WAIS source code did not meet the preamble limitation of claim 25.

Nor did Samsung show how the WAIS source code actually worked at the relevant time. Instead, thirteen years *after* the '959 patent's priority date and in preparation for trial, Dr. Rinard "compiled the [WAIS] code" to create a

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<sup>13</sup> Samsung cites (Br. 47-48) testimony from Brewster Kahle, but he testified about the *original* WAIS version; he did not know if freeWAIS-sf was used in the United States or how it worked. A11867-68.

demonstration system “to show the jury the source code instructions in action,” without evidence that such a system previously existed. A11960-61; *see* A11930. Dr. Rinard conceded that he was “not presenting the demonstration as prior art.” A11937.

Even as compiled and demonstrated, the WAIS source code failed to anticipate. Dr. Rinard created his demonstration system by installing the same WAIS software on two machines, one for searching a device locally and one for searching the Internet. A11930; A12832-33. As Dr. Snoeren testified, however, the system used “two copies of the *same* heuristic” and therefore did not have a “*plurality* of heuristics” as claim 25 requires. A12834.<sup>14</sup> Dr. Snoeren also explained that the claimed heuristics must all reside on one device (A12831-32), while “in Dr. Rinard’s system, the heuristic to search the location on the Internet is actually implemented and located on a machine on the Internet, not the same machine as the client where the user was issuing the request.” A12832-33. These differences sufficiently support the jury’s verdict of no anticipation.

### **C. The District Court Erred In Denying JMOL Of Infringement.**

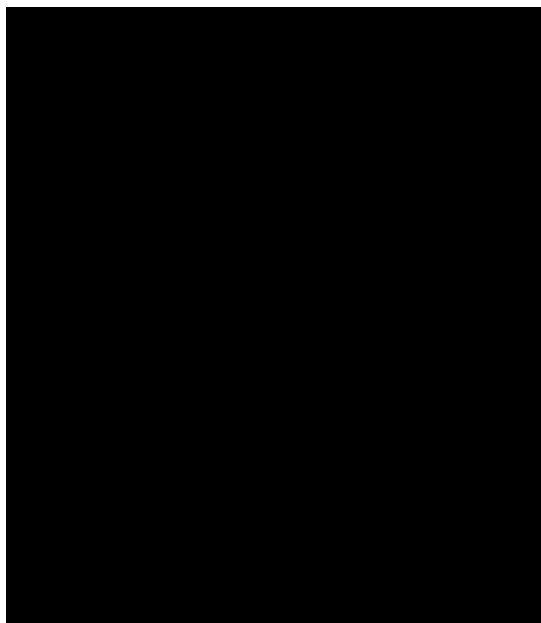
For infringement of the ’959 patent, Samsung disputed only whether its accused products include “a *plurality* of heuristics to locate information in the

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<sup>14</sup> “Plurality” was not construed and therefore has its ordinary meaning of “two or more.” *Dayco Prods., Inc. v. Total Containment, Inc.*, 258 F.3d 1317, 1327-1328 (Fed. Cir. 2001).

plurality of locations which *include the Internet.*” A607; A50276-81. But Samsung’s own witnesses confirmed that Samsung’s products use two or more such heuristics. Because a reasonable jury could only have found infringement on this record, the JMOL denial should be reversed.

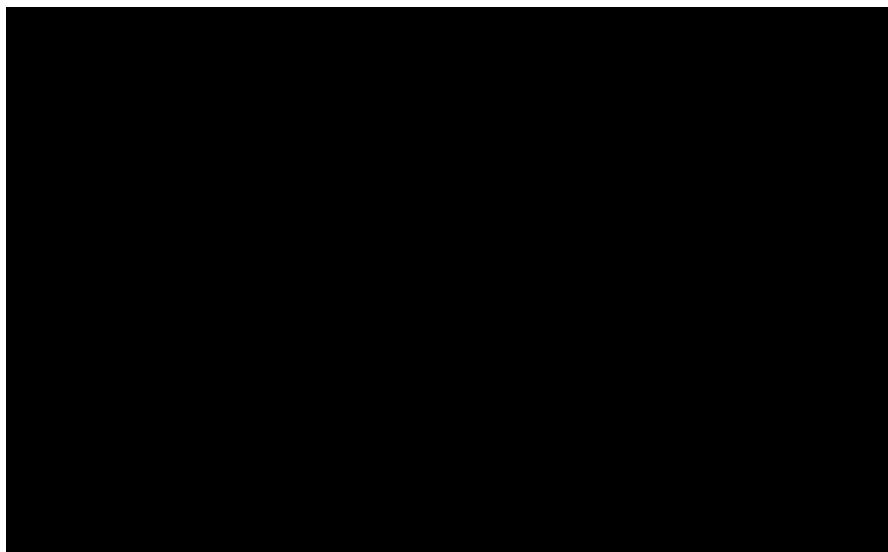
Dr. Snoeren explained that, when a user enters a search on the accused products, the information is passed to the Quick Search Box (or Google Search Application), which “engage[s] multiple modules that ... apply the heuristics and search at different locations.” A10943-46. Samsung devices running the “Gingerbread” version of the Android operating system have *two* heuristics modules: “one is the contacts module, [which] ... search[es] your contacts and the address book on the phone, and the other is called the Web Module, [which] ... return[s] search information that’s collected *from locations on the Internet.*” A10946; *see* A10956.





A50898. The Web Module locates information from “places that the user has actually previously browsed using the web browser” and suggestions presented by “the Google Search Suggestions Server,” which is on the Internet. A10959.

Dr. Snoeren also explained that accused devices running the “Jelly Bean” and “Ice Cream Sandwich” versions of Android have *four* heuristics modules: the Browser Module, which searches bookmarks of websites the user has previously navigated; the Contacts Module (discussed above); the Google Play Music Module, which searches locally stored music information; and the Google Module, which “provide[s] the Internet searching applications.” A10946-48.



A50899. Like the Web Module, the Google Module “look[s] at its own local memory of places on the Internet that ... this user has searched for before” and also “*consult[s] the Google Search Suggestion Server on the Internet.*” A10957.

There was no dispute that Dr. Snoeren identified source code in the accused devices that locates information from locations including the Internet. A50278

(Samsung conceding that “code in the accused Google Search Application queries ‘the Google Search Suggestion Server,’” which is on the Internet (quoting A11009-10)). Nonetheless, Samsung argued that he failed to identify one of the claimed “heuristics” because the “blendResults()” code does not itself locate information on the Internet. A50277-78. But for the Web and Google Modules, Dr. Snoeren identified the Google Content Provider containing the blendResults() function—not the blendResults() code by itself—as the heuristic module that locates information on the Internet. A10953-54 (“[T]hat Content Provider is the ... heuristic functionality we’ve been describing.”); A10955-56 (“[T]he blue circles in my charts, those are all wrapped in Content Providers[.]”); A10956-59 (identifying Google Content Provider source code that includes heuristics); A50894.

Moreover, the blendResults() function undisputedly returns search results from locations including the Internet. As Google engineer Bjorn Bringert testified and Samsung’s expert Dr. Rinard confirmed, blendResults() combines the search results received from the local database and the Internet. A11573 (blendResults() “takes ... the list from the Google Suggest Server and the list ... from the local database, it puts those together and returns one list”); A11897 (blendResults() “took results from the local database and results from the Google servers and blended them together into a single list of results”); A11568-69, A11893 (Google Suggestion Server is “*on the Internet*”).

Because a reasonable jury could only find that Samsung's products include "a plurality of heuristics to locate information in the plurality of locations which include the Internet," this Court should direct JMOL of infringement (or remand for a new trial on infringement) and order further proceedings on remedies.

**V. APPLE'S '414 PATENT IS NOT ANTICIPATED AND IS INFRINGED.**

The '414 patent discloses a system that allows data on two devices, such as a mobile device and a desktop computer, to be synchronized while user applications "run concurrently with the synchronization process." A639(1:65-66); A650(24:42-68). This allows, for example, "a user [to] manipulate or view a calendar while a synchronization operation, which synchronizes structured data from ... the calendar or other databases such as a contact database, is being performed." A639(2:37-40). Non-synchronization software and synchronization software run concurrently in different "threads or processes" on one or both devices. A651(25:1-10).<sup>15</sup>

The relevant portion of claim 11, from which asserted claim 20 depends, requires:

executing at least one *synchronization processing thread* concurrently with the executing of the at least one user-level non-synchronization processing thread, wherein the at least one synchronization processing thread *is provided by a synchronization software component* which is

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<sup>15</sup> A "thread" is "a series of steps that a computer process needs to complete." A50145.

configured to synchronize the structured data from the first database with the structured data from a second database.

A655. Claim 20 additionally requires that “the synchronization software component is *configured to synchronize* structured data of a first data class and other synchronization software components are configured to synchronize structured data of other corresponding data classes.” A655.

**A. Substantial Evidence Supports The Jury’s Finding That Claim 20 Is Not Anticipated.**

Samsung provides no description, figures, or analysis of the Windows Mobile 5 system that it alleges anticipates claim 20. Samsung instead contends that its expert’s testimony was “*unrebutted*.” Br. 49 (emphasis Samsung’s). Even if true, the jury could have rejected that testimony as unsupported or lacking in credibility. *See Amsted Indus. Inc. v. Buckeye Steel Castings Co.*, 24 F.3d 178, 183 (Fed. Cir. 1994) (“[T]he jury is not required to accept testimony as true, even if it is uncontradicted.”); *Guy v. City of San Diego*, 608 F.3d 582, 588 (9th Cir. 2010) (similar). But Samsung’s testimony *was* rebutted by Apple’s expert Dr. Snoeren, who explained that Windows Mobile 5 does not anticipate claim 20. A12857-61.

Samsung points to the “Contacts Provider,” “Calendar Provider,” and “IMAP Mail” components of Windows Mobile 5 as the three claimed “synchronization software components.” Br. 49. Yet none “provided” a synchronization processing thread as claim 20 requires. As Dr. Snoeren testified,

Windows Mobile 5 does not contain *any* synchronization software component that both is configured to synchronize data for a particular data class and provides a synchronization processing thread. A12860.

Samsung now contends that, of the three components it identifies, only the IMAP Mail component “provided” a synchronization processing thread. Br. 49, 51.<sup>16</sup> But when asked which Windows Mobile 5 synchronization software components provided a synchronization processing thread, Samsung’s expert Jeffrey Chase pointed to different components that Samsung does not assert on appeal (“Providers for E-mail, Contacts and Calendar”)—*not* the IMAP Mail component. A12202; A51852. Samsung’s *only* purported evidence supporting its appellate argument is Dr. Chase’s conclusory statement on cross-examination. A12263 (“The IMAP Mail Component does create a thread, yes. It’s a synchronization processing thread.”). Samsung provided no explanation or support for that assertion, which the district court deemed “cursory.” A78.

Although Samsung now invokes unspecified “WM5 source code and documentation” (Br. 49), it never told the jury how such materials supposedly showed the IMAP Mail component providing a synchronization processing thread.

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<sup>16</sup> Samsung’s expert admitted that the Contacts and Calendar Provider components do not create a synchronization processing thread. A12263; A51854. Yet Samsung argued on JMOL that those components met the “provid[ing]” limitation. A76-77. The district court correctly rejected that argument (A76-77), and Samsung has abandoned it.

Samsung's "fact testimony from a WM5 developer" (Br. 49) did not mention the IMAP Mail component at all (A20997-99), nor does the sole document Samsung cites in its brief (A20693).

Meanwhile, Dr. Snoeren explained that, although a synchronization processing thread is provided in Windows Mobile 5 (by a "Sync Client component"), that thread is *not* provided by a synchronization software component configured to synchronize structured data of a first data class, as claim 20 requires. A12860. Samsung does not contest this testimony. Br. 50-51. Samsung instead deems "irrelevant" (Br. 50) Dr. Snoeren's conclusion, based upon his review of the source code, that no software component anywhere in Windows Mobile 5 was "specific to a data class, such as e-mail, contacts, or calendar, and also provided a thread to synchronize that data class." A12860. Dr. Snoeren's conclusion, which the jury could have accepted, directly contradicts Samsung's insistence that the IMAP Mail component is "both class-specific and provide[s] a thread." Br. 51. Samsung did not recall its expert to rebut Dr. Snoeren's testimony, despite the opportunity to do so (A12263-64).

The jury was not required—or entitled—to treat Samsung's cursory and unsubstantiated assertion as clear and convincing evidence of anticipation, particularly given Apple's contrary explanation. *See Whitserve, LLC v. Computer Packages, Inc.*, 694 F.3d 10, 24 (Fed. Cir. 2012) ("[G]eneral and conclusory

testimony ... is certainly not enough to require us to overturn a jury's finding of no invalidity."). The verdict of no anticipation should stand.

**B. The District Court Erred In Denying JMOL Of Infringement.**

For infringement of the '414 patent, Samsung disputed only whether its products contain a third synchronization software component "configured to synchronize" structured data. A12176-77; A12245-50; A50269-70. Neither party sought construction for this language, so the district court instructed the jury to apply its plain meaning. A13172-73.

Dr. Snoeren identified six Sync Adapters in Samsung's products—two each for Email, Calendar, and Contacts—as the claimed "synchronization software components." A10983. Samsung's expert Dr. Chase agreed that all six Sync Adapters are "synchronization software components" and that two of them ("Google Calendar" and "Google Contacts") are "configured to synchronize" structured data for particular data classes (calendar and contacts, respectively). A12175-77; A51838-39. For the others ("Gmail," "Exchange Calendar," "Exchange Contacts," and "Exchange Mail"), Dr. Chase opined that they are not "configured to synchronize" data because they do not perform synchronization themselves. A12189-90; A51839; *see* A50270-71.

Apple's and Samsung's witnesses agreed, however, that the four disputed Sync Adapters at least *cause* the claimed synchronization to occur in Samsung's

products. The Gmail Sync Adapter, for example, calls the Mail Engine to synchronize Google email data with the Gmail server. A10987-89; A50895; A11655-56; A12179-82. Likewise, the Exchange Mail Sync Adapter calls the Exchange Service to synchronize other email data with the Microsoft Exchange server. A10990-91; A11658-59; A12182-83; *see* A10991-92 (addressing other similar Sync Adapters). The undisputed evidence thus demonstrated that all six Sync Adapters are “configured to synchronize” data.

The district court denied JMOL because Samsung’s expert testified that the four disputed Sync Adapters “do not synchronize data themselves, but rather *indirectly ‘cause’ synchronization* by calling other software components.” A100. But claim 20 does not require each synchronization software component to synchronize the data *itself*. It states only that each synchronization software component is “configured to synchronize” data—without specifying whether the synchronization is performed directly or indirectly. A655.

Given the undisputed evidence that a third “synchronization software component” (e.g., the Gmail Sync Adapter) at least *indirectly* performs the required synchronization in Samsung’s products, the district court erred in denying JMOL. *See Moba, B.V. v. Diamond Automation, Inc.*, 325 F.3d 1306, 1314-1316 (Fed. Cir. 2003) (reversing JMOL denial where the only basis for the jury’s non-infringement finding was testimony that the accused infringer did not perform the



claimed “guiding” steps in order, but “the district court’s instructions to the jury did not require sequential performance”).

Because the only possible basis for the jury’s non-infringement finding is contrary to the claim language and unsupported by substantial evidence, this Court should direct JMOL of infringement (or remand for a new trial on infringement) and order further proceedings on remedies.

## **VI. THE AWARD OF ONGOING ROYALTIES TO APPLE SHOULD BE AFFIRMED.**

After the district court denied Apple’s injunction request, Apple filed an interlocutory appeal from that order and alternatively sought ongoing royalties. The district court ruled that, absent injunctive relief, Apple is entitled to ongoing royalties at the same rates awarded by the jury (although the court has not yet calculated or awarded specific amounts). A3-38. Unable to dispute the merits of the award, Samsung alleges that the district court abused its discretion on certain procedural and evidentiary matters. Samsung’s efforts to deprive Apple of *any* relief for Samsung’s ongoing infringement should be rejected.

### **A. The District Court Had Jurisdiction To Order Ongoing Royalties.**

As Samsung concedes, filing a notice of appeal transfers control only “over those aspects of the case involved in the appeal.” Br. 51; *see Marrese v. American Acad. of Orthopaedic Surgeons*, 470 U.S. 373, 378-379 (1985). Therefore, when Apple noticed its interlocutory appeal from the order denying a permanent

injunction, this Court could exercise pendent appellate jurisdiction over other matters only under the “most extraordinary circumstances,” such as if those matters were “inextricably intertwined” with the injunction order. *Falana v. Kent State Univ.*, 669 F.3d 1349, 1360-1361 (Fed. Cir. 2012) (quoting *Swint v. Chambers County Comm’n*, 514 U.S. 35, 51 (1995)); *Cunningham v. Gates*, 229 F.3d 1271, 1284 (9th Cir. 2000).

Samsung argues that, because an ongoing royalty is a form of “equitable relief,” it must be “inextricably bound up with” the injunction order. Br. 52. But just because two remedies are “equitable” does not mean they are “inextricably intertwined.” The district court’s injunction ruling was not predicated on the royalty ruling such that review of the former would “require[]” simultaneously reviewing the latter. *See Entegris, Inc. v. Pall Corp.*, 490 F.3d 1340, 1348-1349 (Fed. Cir. 2007). And the legal test for an injunction is clearly different from the legal test for an ongoing royalty. A16-17; *see Cunningham*, 229 F.3d at 1284-1285 (issues are not “inextricably intertwined” if the court “must apply different legal standards” to resolve them).

Samsung cites no authority suggesting that this case warrants discarding the general rule that the statutory grant of interlocutory appellate jurisdiction does not create pendent appellate jurisdiction over other issues turning on a different legal inquiry. *Paige v. California*, 102 F.3d 1035 (9th Cir. 1996), only reinforces the

point. In *Paige*, a class certification order was deemed “inextricably intertwined” with an order granting a class-wide preliminary injunction because the Ninth Circuit “could not uphold [the injunction] without also upholding the certification of the class.” *Id.* at 1039. Similarly, a grant of partial summary judgment to the *Paige* plaintiff was a “necessary predicate” to the preliminary injunction—without it, the injunction could not stand—and was thus reviewable as well. *Id.* at 1040.

Here, by contrast, the panel reviewing the injunction appeal need not decide whether the district court correctly awarded ongoing royalties. Even Samsung admits that ongoing royalties are an “*alternative*” to an injunction. Br. 52; *see* A13 (“Unlike the class certification and summary judgment rulings in *Paige*, determining Apple’s entitlement to ongoing royalties was not necessary for resolving Apple’s permanent injunction motion.”).

**B. The District Court Did Not Abuse Its Discretion In Rejecting Samsung’s Waiver Argument.**

Samsung’s fallback argument (Br. 52-55)—that the district court abused its discretion in ruling that Apple preserved its ongoing royalty request—also fails. Samsung cites no case reversing a court’s *refusal* to find waiver. Indeed, it would have been error to find waiver here, where Apple—in its complaint and in the pretrial order—requested “all damages adequate to compensate for Samsung’s infringement of Apple’s asserted patents, and in no event less than a reasonable royalty for Samsung’s acts of infringement.” A3056; A40841. That sufficed to

preserve Apple's ongoing royalty claim, given that an ongoing royalty is "a reasonable royalty in light of the ongoing infringement." *Paice LLC v. Toyota Motor Corp.*, 504 F.3d 1293, 1315 (Fed. Cir. 2007). The district court expressly found that "throughout this litigation, Apple has consistently requested royalties to compensate for all Samsung infringement." A8. That was not an abuse of discretion.<sup>17</sup>

Samsung relies (Br. 53-54) on the same two cases it unsuccessfully cited to the district court, "neither controlling and both distinguishable." A9. In *Elvis Presley Enterprises v. Capece*, 141 F.3d 188 (5th Cir. 1998), the Fifth Circuit's waiver holding led to ***affirmance*** of the relevant district court ruling. *Id.* at 206. Moreover, the decision rested on the Lanham Act, which specifically listed "damages" as a distinct remedy from "accounting of profits," and thus barred the plaintiff from seeking an accounting of profits when the pretrial order only stated a request for injunctive relief, damages, and attorneys' fees. *Id.* The Patent Act has no comparable provision. *Ramos v. Davis & Geck, Inc.*, 968 F. Supp. 765 (D.P.R. 1997), is even less applicable. There, the district court found waiver because the plaintiff requested "front pay" as relief for a federal claim, but did not request "front pay" as relief for a Puerto Rico law claim (the claim where waiver arose).

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<sup>17</sup> Apple's pretrial statement also requested "[a]ny other remedy to which Apple may be entitled, including all remedies provided for in 35 U.S.C. §§284, and 285 and under any other law" (A40841), which encompasses ongoing royalties.

*Id.* at 771. As the district court here found, “that is not what occurred here. Apple has consistently sought compensatory royalties for all infringing activity.” A9-10.

Samsung asserts (Br. 54) that three cases the district court cited as examples of courts awarding ongoing royalties under similar circumstances are “inapposite.” But as Samsung implicitly concedes (Br. 54 n.7), the plaintiffs in two of those cases did not request an ongoing royalty in the pretrial order but were still awarded one. A41124-27; A41142. And in *Paice* itself, the court awarded an ongoing royalty even though the plaintiff asked only for a “reasonable royalty.” A7; *see Paice*, 504 F.3d at 1303; *Paice LLC v. Toyota Motor Corp.*, No. 04-cv-211, Dkt. 143 at 3 (E.D. Tex. Dec. 1, 2005) (“Paice contends that it is entitled to a reasonable royalty for Toyota’s infringement, to a permanent injunction ..., and to reasonable attorneys fees.”).

Samsung’s suggestion (Br. 54-55) that it suffered prejudice because the pretrial order did not use the magic words “ongoing royalty” is meritless. Samsung’s only claimed prejudice is that it would have “advocated for a verdict form that made clear whether the jury was awarding a lump sum or a royalty rate.” Br. 54. But Samsung’s own expert Judith Chevalier proposed a royalty that would have compensated Apple for infringement [REDACTED] A51967. And nothing prevented Samsung from proposing a different verdict form. Contrary to its claimed prejudice now, Samsung has sought to use the *general* nature of the

verdict form to suggest that the jury awarded a lump sum—which the district court correctly rejected. A110-13.

**C. The District Court Did Not Abuse Its Discretion By Not Mentioning The HTC License In Its Royalties Order.**

Samsung incorrectly asserts (Br. 55-56) that the district court abused its discretion by failing to mention expressly the rates set in the HTC agreement. But the court had already repeatedly and correctly rejected Samsung’s reliance on the HTC agreement. *E.g.*, A40705-10; *see* A11097-98 (noting it had ruled “three times” to “exclude[] th[e] [HTC] license”; “I think I’ve ruled enough times now that this should not be an issue”); A41055-56 (rejecting Samsung’s reliance on the HTC agreement in the permanent injunction context).

As the district court explained, the HTC agreement resulted from a litigation settlement that ended “50 worldwide patent litigations and other proceedings involving HTC,” and it includes both cross-licenses for HTC patents and “an anti-cloning provision that prohibits HTC from copying any patented design and related functionality from an Apple product.” A40705-07. Additionally, the HTC agreement required [REDACTED]

[REDACTED] A40706; *see Apple Inc. v. Samsung Elecs. Co.*, 735 F.3d 1352, 1370 (Fed. Cir. 2013) (“*Apple III*”) (recognizing “numerous factors” suggesting “*Samsung’s* use” of the patents licensed in the HTC agreement “is different” from HTC’s (emphasis in original)).

Notably, Dr. Chevalier's ongoing royalty declaration [REDACTED]  
[REDACTED]. A50636-74. And her original report conceded that [REDACTED]  
[REDACTED]  
[REDACTED] (A40706); the report also failed to [REDACTED]  
[REDACTED] (A40709-10). This failure to  
"appropriately adjust the running royalty found in the HTC Agreement ... in a  
manner that accounts for the different economic circumstances at play" rendered  
Dr. Chevalier's testimony "insufficiently reliable" to present to the jury, and also  
made incorporating the HTC agreement into the district court's ongoing royalty  
calculations "appear to be impossible." A40710. Accordingly, the court did not  
abuse its discretion by declining to address the HTC agreement in its ongoing  
royalty order.

Finally, Samsung suggests that the district court's ongoing royalty rates were  
"grossly inflated." Br. 56. But the court "determine[d] that the proper ongoing  
royalty rates are those reflected in the jury verdict" (A37)—amounts Samsung does  
not challenge on appeal.

**VII. THE DISTRICT COURT DID NOT ABUSE ITS DISCRETION IN ITS  
EVIDENTIARY RULINGS.**

Although Samsung has not requested a new trial on Apple's patents or  
damages (Br. 13, 61, 67), it "conditionally appeals" three evidentiary rulings if this

Court orders a new trial. Br. 61. The district court's rulings were well within its discretion.

**A. The District Court Did Not Abuse Its Discretion In Admitting Testimony About Dr. Hauser's Conjoint Survey.**

Samsung objects to testimony by Apple's survey expert John Hauser and Apple's damages expert Christopher Vellturo regarding a conjoint survey Dr. Hauser conducted. Br. 61-62. As the district court ruled, Samsung's arguments go at most to weight, not admissibility. A40720-29.

*First*, Samsung claims that the "willingness to buy" results of a conjoint survey cannot be used to calculate changes in market share. Br. 62. Samsung points to an order from an unrelated case (Br. 63), but that ruling was expressly limited to its particular facts and disclaimed any pronouncement on conjoint surveys generally. *Oracle Am., Inc. v. Google Inc.*, 2012 WL 850705, at \*10 (N.D. Cal. Mar. 13, 2012) ("This order, however, need not decide the broad question of whether conjoint analyses are rigorous enough for predicting changes in market share.... Dr. Shugan's conjoint analysis *in this particular instance* is an unreliable predictor of market share."). Under the circumstances of *this case*, the district court correctly "conclude[d] that Dr. Vellturo's use of Dr. Hauser's choice-based conjoint survey with an outside option to quantify the diminished demand that



Samsung would have experienced after it designed around the patented features is sufficiently supported by the literature and is therefore admissible.” A40727.<sup>18</sup>

**Second**, Samsung alleges that the district court should have excluded Dr. Hauser’s conjoint survey because it improperly omitted major product features. Br. 63. But Samsung’s own experts and employees conceded that several features that Dr. Hauser’s survey tested—including screen size, camera capabilities, and price—are “major factors” and “big purchase decision drivers.” A11689-90; A12083; A12315-16. Samsung’s quibble over exactly which features Dr. Hauser included does not render his survey unreliable and instead “goes to weight, not admissibility.” A40726.

**Third**, Samsung complains that Dr. Hauser’s survey produced “absurd[]” results (Br. 63), but no Samsung expert performed a conjoint survey contradicting Dr. Hauser’s conclusions. A12500-05. While Samsung suggests that Dr. Hauser’s combined “willingness to pay” numbers exceeded a smartphone’s cost, Samsung’s own survey expert David Reibstein admitted that the figures are “not strictly additive.” A50364; *see* A40723. As to Dr. Hauser’s “willingness to buy” results,

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<sup>18</sup> Samsung also argues that conjoint surveys “cannot account for numerous variables that affect real-world market share.” Br. 63. But Dr. Vellturo simply used Dr. Hauser’s “willingness to buy” results as one input, along with other inputs including actual real-world market share, which *does* account for such variables. A11301-06; *see* A40723 (district court observing that “market share here was calculated on the basis of third-party data, not Hauser’s conjoint survey”).

Samsung deems it “implausible” that removal of a single feature could lead to the declines predicted (Br. 64), but Samsung again did not produce any conjoint survey challenging these findings. And Samsung’s own behavior confirms that consumers value the ’647 patent’s “Quick Links” feature: even *after* being found to infringe, Samsung still has not removed that feature from all infringing products. A50680.<sup>19</sup>

**B. The District Court Did Not Abuse Its Discretion In Excluding Evidence From Different Cases.**

Samsung asserts that the district court should have admitted evidence regarding the HTC agreement and a damages calculation from another litigation not involving Samsung. Br. 64-65. The court acted within its discretion after properly balancing the evidence’s probative value against the potential for prejudice.

*First*, Samsung alleges that Dr. Chevalier should have been permitted to rely on the HTC agreement (Br. 65), but as discussed above (pp. 58-59), the district court repeatedly and properly excluded testimony regarding the HTC agreement because it was *not* comparable. A40705-06; *see Apple III*, 735 F.3d at 1370.

Neither case cited by Samsung (Br. 65) compels a different result. In *Ericsson, Inc. v. D-Link Systems Inc.*, 773 F.3d 1201 (Fed. Cir. 2014), this Court

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<sup>19</sup> Samsung also disputes the predicted decline in sales for products lacking several of the patented features (Br. 64), but Dr. Velturo did not rely on those numbers at trial. A11302-03.

held that “[t]estimony relying on licenses must account for such distinguishing facts when invoking them to value the patented invention.” *Id.* at 1227. And in *LaserDynamics, Inc. v. Quanta Computer, Inc.*, 694 F.3d 51 (Fed. Cir. 2012), this Court held that a district court abused its discretion by **admitting** a settlement agreement of “dubious” probative value. *Id.* at 78. These cases support the district court’s exclusion of Dr. Chevalier’s testimony on the HTC agreement after concluding that her “failure to adequately account for the agreement’s cross license” and “failure even to attempt to make adjustments for” the agreement’s other unique factors “render[ed] her opinions related to the HTC Agreement insufficiently reliable.” A40710.

**Second**, it was not an abuse of discretion to exclude evidence of Apple’s proposed royalty rate in a litigation between Apple and Motorola, which Samsung proposed to introduce via a court order from that case. A40805-07. As the district court here recognized, *Motorola* involved “different products, different defendants, different party circumstances, different implementations in the accused products, [and] different non-infringing alternatives.” A40806-07. “[B]ased on all the[se] differences,” the court determined that the “probative value [would] be minimal,” that admitting this evidence would invite a “minitrial as to what happened” in *Motorola*, and that the evidence was “overly prejudicial because it ha[d] the

imprimatur of [another] district court.” A40806-07; A50173. That was not an abuse of discretion.

**C. The District Court Did Not Abuse Its Discretion In Admitting Testimony Regarding A Lost Profits “Blackout Period.”**

Samsung’s contention (Br. 65-67) that the district court abused its discretion in permitting Dr. Vellturo to present a lost profits theory under which Samsung’s products were off the market while Samsung “designed around” Apple’s patents also fails. As Dr. Vellturo explained, Samsung did not actually implement any design-around for the ’647 patent during the damages period. A11294.

Nevertheless, using the actual amount of time Samsung took to implement design-arounds to other Apple patents, Dr. Vellturo conservatively assumed that Samsung could have hypothetically redesigned its smartphones to avoid infringement of the ’647 patent within four months of the launch of its first infringing product. A11335. To reconstruct the marketplace “but for” Samsung’s infringement, Dr. Vellturo reallocated sales of Samsung’s infringing products across other manufacturers (including back to Samsung based upon Samsung’s market share for non-accused products) during the four-month design-around period. A11294-96.

This methodology was sound, and the district court did not abuse its discretion in allowing it. Apple provided Samsung with notice of the ’647 patent in August 2010 (A11047; A51423), and Samsung launched its first product found

to infringe that patent in August 2011 (A11267). Samsung argues that it is “implausible” it would release a product a year after having notice and “then suffer a blackout period when it took the infringing product off the market to replace it with a non-infringing alternative.” Br. 67. Samsung ignores, however, that at no point during the damages period—even *after* Apple filed this lawsuit—did Samsung actually implement a design-around for the ’647 patent. A11294.

*Grain Processing Corp. v. American Maize-Products Co.*, 185 F.3d 1341 (Fed. Cir. 1999), is not to the contrary. It holds that where, as here, “an alleged alternative is not on the market during the accounting period, a trial court may reasonably infer that it was not available as a noninfringing substitute at that time.” *Id.* at 1353. It is the *infringer’s* “burden to overcome this inference by showing that the substitute was available during the accounting period.” *Id.* The district court acted well within its discretion in admitting Dr. Vellturo’s lost profits theory.

#### **VIII. THE NON-INFRINGEMENT JUDGMENT FOR SAMSUNG’S ’239 PATENT SHOULD BE AFFIRMED.**

Samsung asserted the ’239 patent against Apple’s iPhone 4, iPhone 4S, and iPhone 5. A12539.<sup>20</sup> The disputed limitation of asserted claim 15 recites “means for transmission of said captured video over a cellular frequency.” A720. The district court construed that element as a means-plus-function limitation requiring

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<sup>20</sup> Samsung dropped its infringement allegations against Apple’s iPad products (A50202-03) and has not appealed the non-infringement judgment for those products (A119-22).

the function of “transmission of said captured video over a cellular frequency,” and the following structure to perform that function:

one or more modems connected to one or more cellular telephones, and software performing a software sequence of initializing one or more communications ports on said apparatus, obtaining a cellular connection, obtaining said captured video, and transmitting said captured video.

A150. That construction is correct, and Samsung has shown no prejudice from it. Therefore, the jury’s non-infringement finding should be affirmed.

**A. The District Court Correctly Construed The “Means For Transmission” Structure To Include Software.**

Samsung incorrectly contends (Br. 56) that the district court erred by including software as part of the required structure for the “means for transmission” limitation.

Samsung first asserts that the specification discloses only hardware as performing the claimed transmission function. Br. 57-58. But “corresponding structure must include all structure that actually performs the recited function.” *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 296 F.3d 1106, 1119 (Fed. Cir. 2002). As the district court correctly found (A144; A261-63), the specification repeatedly states that “transfer software” is what “enables”—and is “necessary” to perform—the transmission of captured video over a cellular frequency:

*Transfer software sequence B enables the remote unit to communicate with the host unit to transmit a stored data file using the system hardware. Transfer software*

*sequence B contains all of the instructions necessary to initialize the communications ports on the remote, obtain a cellular connection with each cellular telephone to the host unit, obtain the stored data file, initiate file splitting sequence C, and **transmit the split data file**.*

A717(8:23-30); *see* A717(8:17-21) (“Transmission of a data file is accomplished by selecting the ‘TRANSFER’ button 26 .... [which] initiates the transfer software sequence B[.]”); A717(8:38-42) (software sequence B is “called for each communications port to which the data file will be transmitted,” and “[i]n the preferred embodiment, transfer software sequence B will be called four times”); A717-18(8:63-9:2). Thus, because the specification “‘clearly links or associates’” the transfer software with the claimed transmission function, that software must be included in the required structure. *Noah Sys., Inc. v. Intuit Inc.*, 675 F.3d 1302, 1311 (Fed. Cir. 2012) (citation omitted); *see also TecSec, Inc. v. IBM Corp.*, 731 F.3d 1336, 1349 (Fed. Cir. 2013) (identifying software as corresponding structure for means-plus-function limitations).<sup>21</sup>

Nor did the district court err, as Samsung urges (Br. 58), by including software from the preferred embodiment. The court did not incorporate all five software algorithms described in the preferred embodiment. A145-46 (“[C]laim 15 does not require software for initiating file splitting[.]”); A262-63 (excluding step

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<sup>21</sup> Before *Markman*, Samsung recognized that claim 1’s “means for transmitting” limitation required structure including “associated software.” A50042.

of “splitting and organizing the file”). Instead, the court properly included only those software steps “necessary for performing the basic function of transmitting.” A262-63 (“[T]he other steps performed by software sequence B—initializing communication ports, obtaining the stored data file, and transmitting the stored data file—all appear to be necessary for any transmission[.]”); A146 (the task of “obtaining a cellular connection” is necessary for claim 15).

Samsung suggests (Br. 58) that claim 15’s required structure cannot include software because dependent claim 16 provides that the “means for transmission ... includes: at least two interfaces operating in conjunction with said computer; [and] a cellular telephone connected to each said interface” (A720). But the structure required by a means-plus-function limitation is defined by the “corresponding structure, material, or acts described in the specification,” 35 U.S.C. §112(f)—not by the scope of a dependent claim. *See Laitram Corp. v. Rexnord, Inc.*, 939 F.2d 1533, 1538 (Fed. Cir. 1991) (“‘[C]laim differentiation’ cannot override the statute. A means-plus-function limitation is not made open-ended by the presence of another claim specifically claiming the disclosed structure which underlies the means clause or an equivalent of that structure.”). In any event, nothing in claim 16—which requires “*at least* two interfaces ... [and] a cellular telephone”—*excludes* software from the required structure.



Finally, the district court did not err by requiring software used for “initializing ... communications ports” and “obtaining a cellular connection ... [and] captured video.” Br. 58-59 (quoting A150). As the court correctly found (A145-46; A262-63), the specification explicitly describes the “initializ[ing]” and “obtain[ing]” aspects of the “transfer software” as part of the structure that “enables the remote unit ... to transmit a stored data file” and as “necessary” for the claimed transmission function (A717(8:17-30)).

**B. The District Court’s “Means For Transmission” Construction Correctly Excluded “Cellular Radio Transmitters.”**

Samsung also challenges (Br. 59) the district court’s refusal to add “cellular radio transmitters” to the required structure for the “means for transmission” limitation. There was no error.

The only hardware structure disclosed in the specification for “transmission” of video “over a cellular frequency” is “one or more modems connected to one or more cellular telephones.” A150; *see* A715(4:25-27) (“The remote unit also has up to four computer interfaces such as modems, each connected to a cellular telephone.”); A717(8:40-41) (“Each modem interfaces through a different communications port[.]”).

Conversely, as Samsung concedes (Br. 59), the specification does not mention a “cellular telephone transmitter,” or otherwise explain what one is, how it works, or how it might be involved (if at all) in the claimed transmission function.

Given that lack of disclosure, the district court correctly held that a “cellular telephone transmitter” is not required structure (A142-43)—which, under Section 112(f), must be “described in the specification.” *Ergo Licensing, LLC v. Carefusion 303, Inc.*, 673 F.3d 1361, 1364 (Fed. Cir. 2012) (“[A] patentee is only entitled to ‘corresponding structure ... described in the specification and equivalents thereof.’” (quoting 35 U.S.C. §112(f))).

Samsung cannot alter that result by arguing (Br. 59) that “cellular radio transmitters” are “implicit[ly]” part of the required structure under *Atmel Corp. v. Information Storage Devices, Inc.*, 198 F.3d 1374 (Fed. Cir. 1999). In *Atmel*, this Court held that a patentee had disclosed sufficient structure for a “high-voltage generator circuit” based on the specification’s statement that “[k]nown [c]ircuit techniques are used to implement high-voltage generator circuit 34,” citation of an article titled “On-Chip High Voltage Generation in NMOS Integrated Circuits Using an Improved Voltage Multiplier Technique,” and “unrebutted” expert testimony that a skilled artisan would understand the “precise structure” from that disclosure. *Id.* at 1377, 1382.

Here, by contrast, the ’239 specification does not even mention “cellular radio transmitters,” nor does Samsung cite any expert testimony (unrebutted or otherwise) supporting its position. Because the specification *explicitly* discloses the structure required for the claimed transmission function—including the

agreed-to portion of the construction requiring “one or more modems connected to one or more cellular telephones,” and the transfer software discussed above—Samsung has no basis to read supposedly “implicit” additional structure into the claims. *See B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed. Cir. 1997) (declining to find implicit the disclosure of “an alternative structure,” where the specification provided a “clear disclosure” of the corresponding structure).

**C. Samsung Cannot Show Prejudice From The District Court’s Purported Error.**

Even if Samsung could identify an error in the “means for transmission” construction—and it cannot—any such error would be harmless, particularly given Samsung’s failure to demonstrate how it might prevail under its proposed construction. Samsung has made no attempt to meet its burden beyond its conclusory assertion, offered without explanation or analysis, that “there was substantial evidence that Samsung likely would have prevailed under the correct claim construction.” Br. 60; *see Eaton Corp. v. Rockwell Int’l Corp.*, 323 F.3d 1332, 1344 (Fed. Cir. 2003) (party alleging claim construction error “must show ... that the error was prejudicial” to warrant new trial).

Moreover, there is no presumption of prejudice “whenever a general verdict makes it impossible to discern on which specific limitation the jury rested its verdict of noninfringement[;] ... the burden to establish [prejudice] is on the party challenging the verdict.” *SSL Servs., LLC v. Citrix Sys., Inc.*, 769 F.3d 1073, 1084-

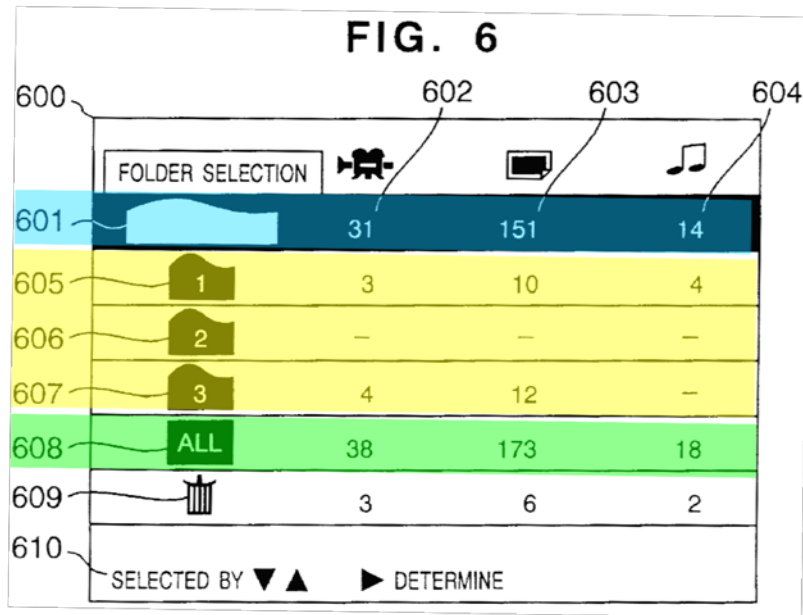
1085 (Fed. Cir. 2014). Apple presented ample evidence demonstrating that the accused iPhones do not include the “video capture module” required by claim 15. A12749-54; *see* A12723-24; A12735-49. Because “even if the district court erred in its construction of the other ... limitations, the result the jury reached—the finding of non-infringement—would not change,” the verdict should be affirmed. *SSL*, 769 F.3d at 1084.

**IX. THE INFRINGEMENT JUDGMENT FOR SAMSUNG’S ’449 PATENT SHOULD BE REVERSED.**

The ’449 patent describes a “digital camera” that includes hardware and software for recording, classifying, and searching still images (photos) and moving images (videos). A50765; A12602; A12769-71.

The claimed camera includes “a compressor” that uses two different compression methods, one for photos and another for videos. A50765. It similarly includes “a decompressor” that uses two different decompression methods for photos and videos. A50765; A50746(Fig.4) (showing single encoder/decoder 409); A50758-59(3:54-67, 4:10-16, 5:29-44). The patent explains that using a single compressor and a single decompressor for both photos and videos saves circuitry. A50758(4:16-25); A12780.

Figure 6 of the patent shows “a display screen on which ... recorded data is classified” (A50757(2:14-15)):



A50747 (highlighting added). A user can organize photos and videos into classifications, such as classifications 605, 606, and 607 (yellow). A50759-60(6:66-7:3); A12787-88. By contrast, folder 608 (green) is not a classification; it includes “ALL” photos and videos stored on the device. A50760(7:3-7); A12788.

The '449 patent further describes a “list retrieving operation” that allows users to perform a search and then select the desired photo or video from a resulting “list.” A50760(8:19-22); A50757(1:60-61). The asserted claim refers to this “retrieving operation” as a “search mode” (A50765), and the patent describes this feature as an improvement over prior art camcorders, which did not permit users to locate a specific photo or video without scrolling through the entire library of stored photos and videos. A50757(1:27-35) (criticizing the scrolling retrieval method as “lack[ing] in practicability”); A12770; A12778.

The relevant portions of claim 25, from which asserted claim 27 depends, require:

*a compressor* which compresses said digital signal outputted from said A/D converter, and generates compressed data by *using a different compressing method for moving image signals and for still image signals*; ...

*a decompressor* which decompresses said compressed data by *using a different decompressing method according to whether said recorded compressed data is a moving image signal or a still image signal*; ...

*a display which displays* said moving image signals and still image signals outputted from said reproducing circuit, and *a list of said moving image signal and still image signal as a search mode*, and a list of classifications as a classification mode; ... [and]

*wherein said recording circuit records each one of said plurality of image signals with classification data.*

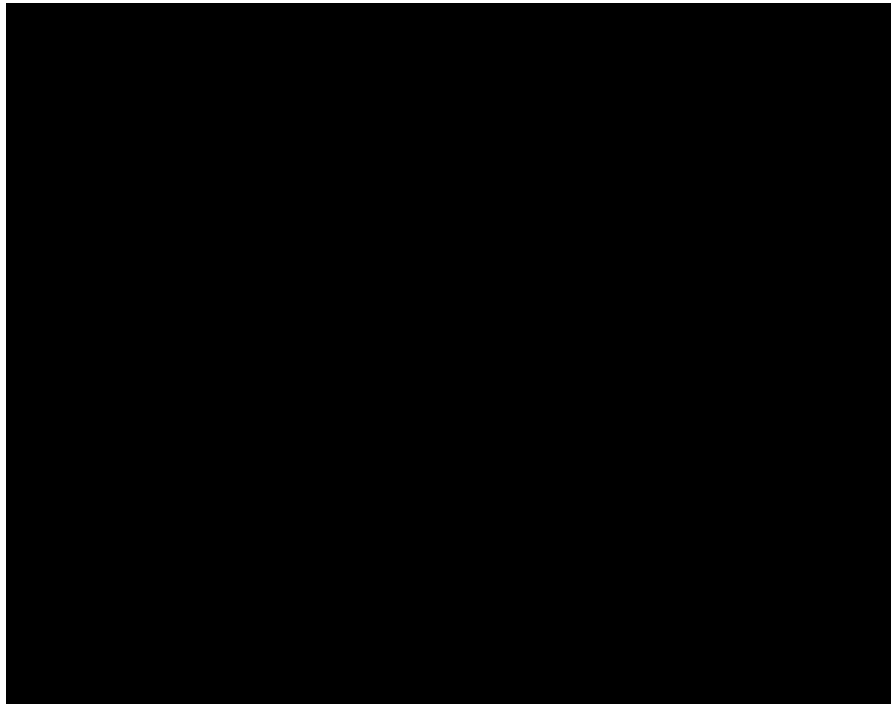
A50765.

The jury found that Apple infringed claim 27 and awarded Samsung \$158,400 in damages. A40878-79. But Samsung failed to present substantial evidence of infringement for three claim limitations. Accordingly, the infringement judgment should be reversed and the damages award to Samsung vacated.

**A. No Reasonable Jury Could Have Found That Apple’s Products Meet The “Compressor”/“Decompressor” Limitations.**

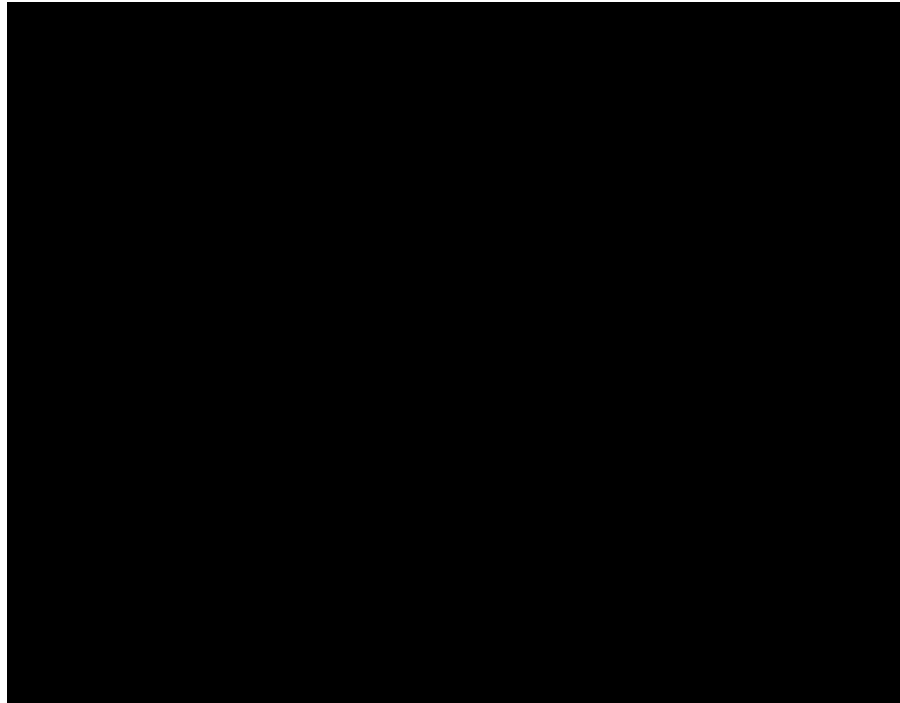
The district court instructed the jury to apply the plain meaning for the “compressor” and “decompressor” limitations. A13172-73. Both parties’ experts agreed that, under a plain meaning interpretation, the “compressor” limitation requires *one compressor* that “uses different compressing methods for photos and videos.” A12615; A12779 (“[I]t has to be a single compressor that has these two different methods built into it, one for [still] images, one for video.”). They similarly agreed that the “decompressor” limitation requires *one decompressor* that uses different decompression methods for photos and videos. A12618; A12786.

Nor was there any dispute about the relevant operation of Apple’s products, which use *different components* to compress photos (blue) and videos (green):



A51924; *see* A12616; A12704-05; A12782-83.

Apple's products also use *different components* to decompress photos (blue) and videos (green):



A51932; *see* A12618-19; A12708-09; A12786.

These photo and video components are supplied by different companies, are located in different places on the chip, and do not share any circuitry used for compression/decompression. A12703-09; A12655; A12780-86. As Apple engineer Tim Millet explained, Apple designed its products this way to “save power” (because the video components can be turned off when taking photos) and to provide “flexibility with regard to features” (because users can “take a [photo] at the same time they’re capturing video”). A12705-07; *see* A12784-85. Based on that record, no reasonable jury could have found that Apple’s products satisfied the “compressor” and “decompressor” limitations.



In denying JMOL, the district court did not identify a single compressor or decompressor in Apple's products that can perform different types of compression/decompression on photos and videos, as claim 27 requires. Instead, the court relied upon the testimony of Samsung's expert Kenneth Parulski that "a single Apple *design chip* [includes] the circuitry that performs both compressing methods." A118 (quoting A12649-50). But it was undisputed that each design chip includes *two separate components* for compression, *two separate components* for decompression, and "a large number of different components" that have nothing to do with compression or decompression. A12699; *see* A12705-06; A12655 ("There is a single chip with lots of circuitry."); A12782-83. There is no evidence that Apple's products contain a single compressor (or a single decompressor) that can perform different types of compression (or decompression) on photos and videos. The infringement judgment should be reversed.

**B. No Reasonable Jury Could Have Found That Apple's Products Meet The "Search Mode" Limitation.**

Samsung also failed to show that Apple's products include "a display which displays ... a list of said moving image signal and still image signal as a *search mode*." A50765. For that limitation, Mr. Parulski merely identified the Camera Roll feature, which indisputably displays every stored photo and video captured with the device—and *does not permit searches of any kind*—such that a user must scroll through the entire library to locate a specific photo or video:



A51941; *see* A12621-25; A12684; A12772-78.<sup>22</sup>

No reasonable jury could have found infringement based on that “scroll-through-the-entire-library” feature, which is the same prior art feature that the ’449 inventors expressly criticized and claimed to “overcome.” A50757(1:27-44) (criticizing “the method of retrieving the great deal of recorded data [and] checking all images reproduced on screen from the recorded data” as “lack[ing] in practicability”); A12649 (Samsung’s expert agreeing that the ’449 patent’s purpose

<sup>22</sup> The district court stated that Figure 8 of the ’449 patent “shows a sample search mode with thumbnails.” A119. But nothing in the patent describes Figure 8 in that manner. A50761(9:17-26).

was to have a solution “*rather* than brows[ing] through the entire collection of images to find a particular image”); A12778-79; *see Ballard Med. Prods. v. Allegiance Healthcare*, 268 F.3d 1352, 1362 (Fed. Cir. 2001) (“[The patentee] gave specific, detailed reasons for distinguishing his valve from the prior art valves, and in light of those statements no reasonable jury could find that the disclosed valve is equivalent to the valve structure in the accused devices.”).

The district court ruled that “a reasonable jury could have rejected [Apple’s expert’s] characterization of the Camera Roll as not having a ‘list of said moving image signal and still image signal as a search mode’” based on Mr. Parulski’s “contrary opinion.” A119 (citing A12623-24). But the court did not explain how a reasonable jury could do so when Mr. Parulski’s “contrary opinion” rested on a feature that involves *no searching* at all, and is the same prior art feature that the ’449 patent explicitly criticized.

**C. No Reasonable Jury Could Have Found That Apple’s Products Meet The “Classification Data” Limitation.**

Samsung offered no substantial evidence that Apple’s products contain a “recording circuit” that “records each one of said plurality of image signals with classification data.” A50765. Samsung’s evidence consisted of a single conclusory sentence from Mr. Parulski:

Apple’s corporate representative has confirmed – and I inspected the source code as well, and it confirmed that there’s a single database in the iPhone 5, as well as the

other products that stores not only the photos and videos, but stores, for example, which images are in the Camera Roll and the other rolls.

A12626. This testimony does not identify any classification data, and certainly no classification data stored with every image.

That is because, as Apple's expert James Storer explained, Apple's products do not record classification data for each stored image. Rather, as both experts agreed, Apple's Camera Roll feature includes *every stored image* taken with the device, including images *never classified* into an album—just like “ALL” folder 608 depicted in Figure 6 of the '449 patent. A12648 (“So every video or photo that you’ve taken with that actual camera, that actual iPhone ... will be in the Camera Roll.”); A12786-89 (“Camera Roll is simply the place where everything goes that you’ve taken. Nothing is classified and there’s no classification as you’re recording.”); A50759-60(6:56-7:7); A50747(Fig.6). Thus, there is no evidence—let alone substantial evidence—that Apple's products store classification data “for *each one* of said plurality of image signals.”

The district court ruled that “the jury could have credited Mr. Parulski's explanation and concluded that the fact that the accused devices can distinguish Camera Roll photos from other photos indicates the presence of classification data.” A118-19. But the court did not identify any classification data stored for each image contained in Camera Roll, as claim 27 requires, or address Dr. Storer's

unrefuted testimony that no such classification data is stored. The infringement judgment against Apple should be reversed.

### **CONCLUSION**

The judgment should be affirmed with respect to Samsung's infringement of Apple's '647 and '172 patents; validity of Apple's '721, '172, '959, and '414 patents;<sup>23</sup> the award of \$119,625,000 in damages plus pre-judgment interest, supplemental damages, and ongoing royalties to Apple; and non-infringement of Samsung's '239 patent.

The non-infringement judgment for Apple's '959 and '414 patents should be reversed (or remanded for a new trial on infringement) and remanded for determination of remedies. The jury's willfulness verdict for Apple's '721 patent should be reinstated and remanded for determination of enhanced damages. The infringement judgment for Samsung's '449 patent should be reversed and the \$158,400 damages award vacated.

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<sup>23</sup> The '647 validity judgment and '721 infringement judgment, neither of which Samsung appeals, should also be affirmed.

Respectfully submitted,

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May 11, 2015

# **ADDENDUM**

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(12) **United States Patent**  
**Inoue et al.**

(10) **Patent No.:** **US 6,226,449 B1**  
(45) **Date of Patent:** **\*May 1, 2001**

(54) **APPARATUS FOR RECORDING AND REPRODUCING DIGITAL IMAGE AND SPEECH**

(75) **Inventors:** **Hisashi Inoue, Kashiwa; Keiji Nagayama; Tomishige Yatsugi**, both of Hitachinaka, all of (JP)

(73) **Assignee:** **Hitachi, Ltd., Tokyo (JP)**

(\*) **Notice:** This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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5,786,851 \* 7/1998 Kendo et al. .... 348/232  
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7284058 10/1995 (JP)

\* cited by examiner

*Primary Examiner*—Wendy Garber

*Assistant Examiner*—Christopher Onuaku

(74) *Attorney, Agent, or Firm*—Antonelli, Terry, Stout & Kraus, LLP

(21) **Appl. No.:** **08/838,286**

(22) **Filed:** **Apr. 17, 1997**

(30) **Foreign Application Priority Data**

Apr. 17, 1996 (JP) ..... 8-095498  
Feb. 17, 1997 (JP) ..... 9-032200

(51) **Int. Cl.** **H04N 5/225**

(52) **U.S. Cl.** **386/120; 348/231**

(58) **Field of Search** ..... 386/38, 69, 70, 386/120, 121, 97, 95; 348/220, 232, 231, 233, 234, 222; 360/72.2; 358/296; 345/328

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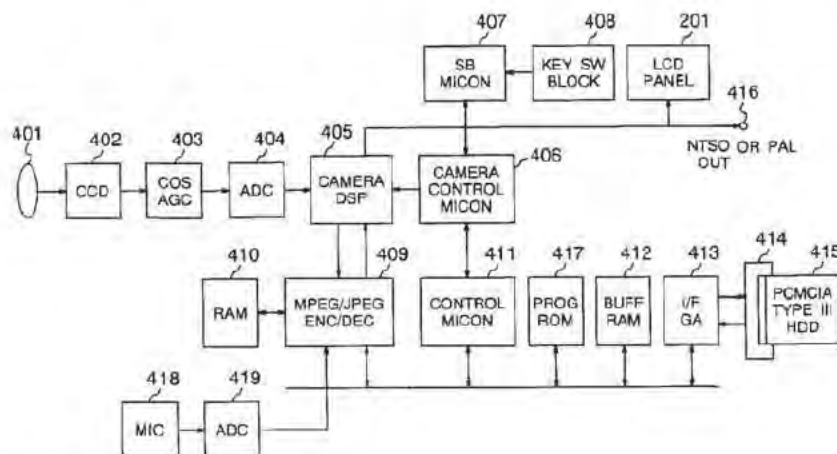
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(57) **ABSTRACT**

A digital image and speech recording and reproducing apparatus is arranged to quickly and simply retrieve, classify, and erase a great deal of data for improving the operativity in small-sized equipment. The apparatus includes a recording and reproducing unit for a moving image signal, a recording and reproducing unit for a still image signal, a recording and reproducing unit for a digital speech signal operated in synchronous to the image, a display for displaying the image for said moving image signal or said still image signal, a recording condition recording unit for recording recording conditions containing data information about recorded data for distinguishing said moving image from said still image and recording time information for recording an image or a speech. The recording conditions consisting of at least the data information and the recording time information about the recorded data are graphically and literarily displayed on the display, so that the recorded data item may be selected on the display screen.

**31 Claims, 13 Drawing Sheets**



**JOINT TRIAL EXHIBIT NO. 22**

United States District Court  
Northern District of California  
No. 12-CV-00630-LHK (PSG)

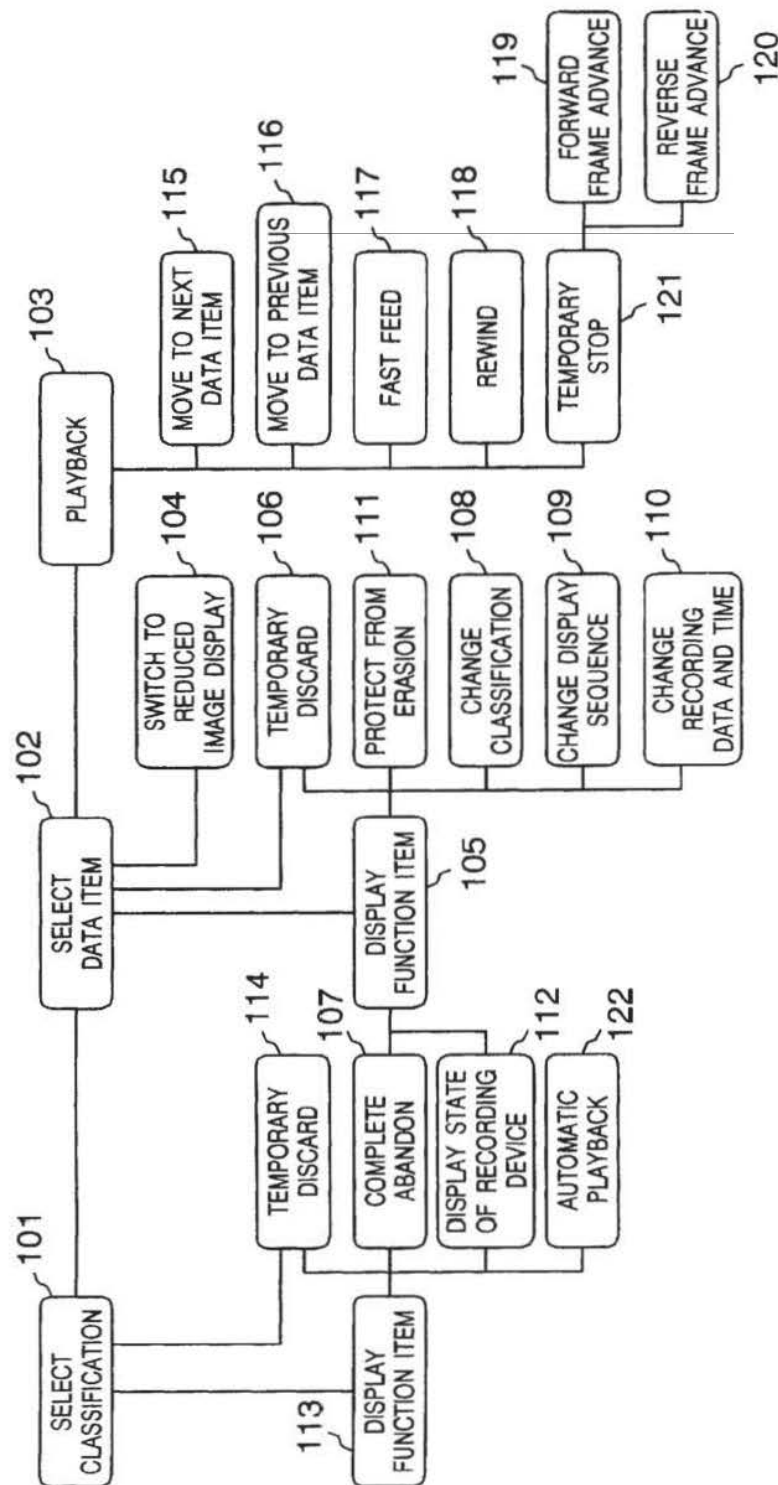
*Apple Inc. v. Samsung Elecs.*

Date Admitted: \_\_\_\_\_ By: \_\_\_\_\_

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**SAMNDCA630-07887580**

**FIG. 1**

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**A50744**

FIG. 2

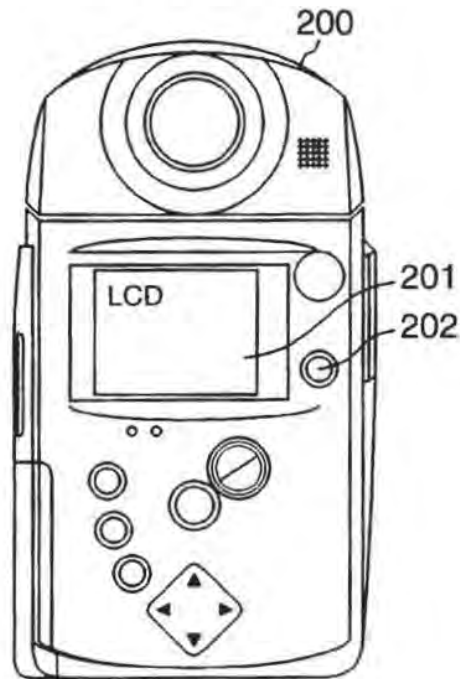
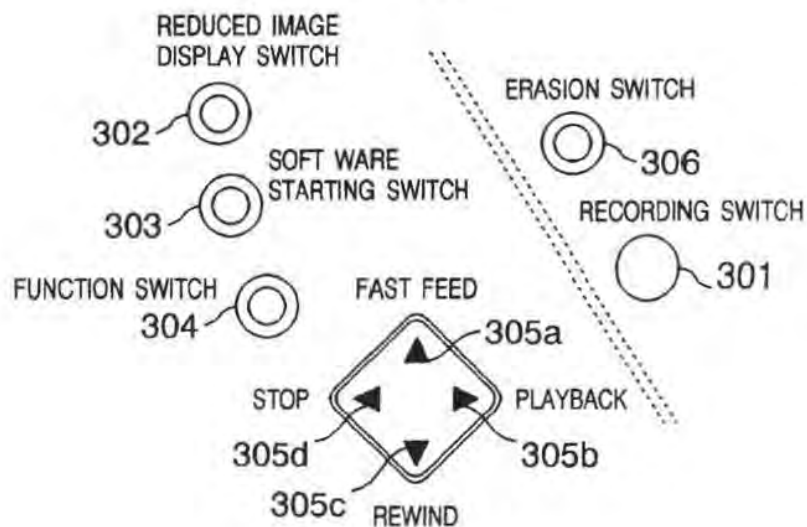


FIG. 3



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Figure 1 is a schematic diagram of a display screen layout. The screen is a rectangle with a grid of dots. The total width is 352DOT, and the total height is 240DOT. The layout is divided into several areas: 505 (top left, 160x120), 503 (top right, 192x120), 500 (top right margin, 12DOT), 502 (right margin, 24DOT), 506 (bottom right margin, 12DOT), 507 (bottom margin, 16DOT), 504 (bottom left margin, 16DOT), and 501 (left margin, 24DOT). The main content area is divided into 'AREA FOR DATA AND FUNCTIONS' (top) and 'AREA FOR OPERATING PROCEDURE' (bottom).

Folder Selection	31	151	14
1	3	10	4
2	—	—	—
3	4	12	—
ALL	38	173	18
Trash	3	6	2

SELECTED BY ▼ ▲ ► DETERMINE

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FIG. 7

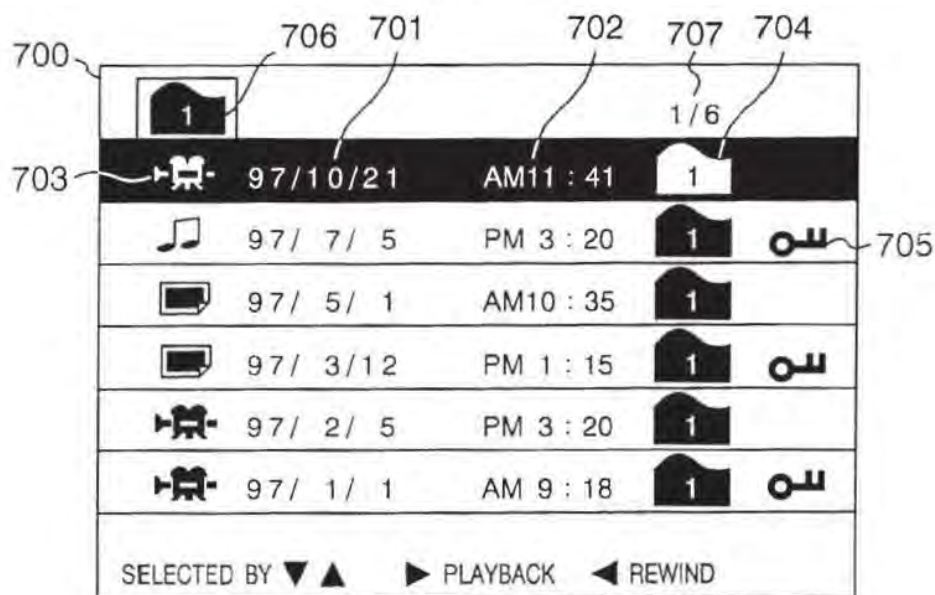


FIG. 8

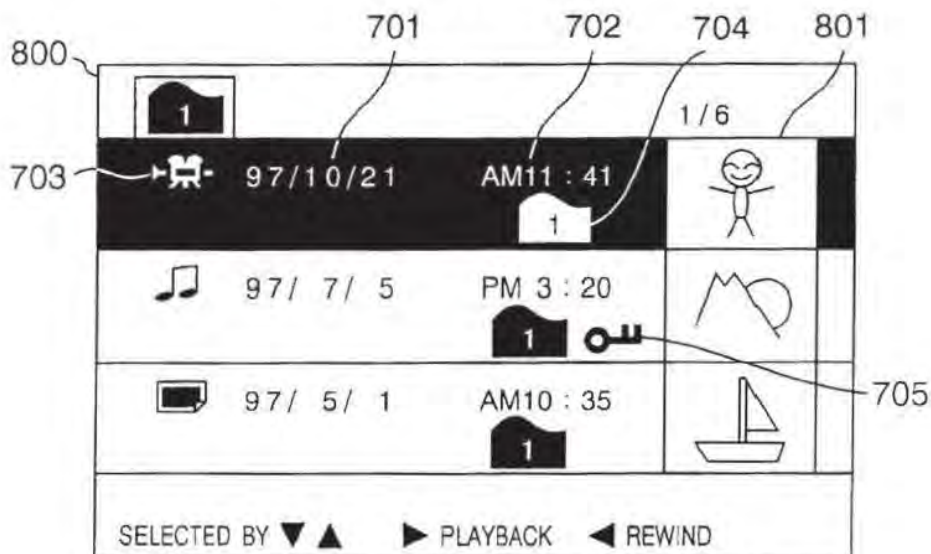
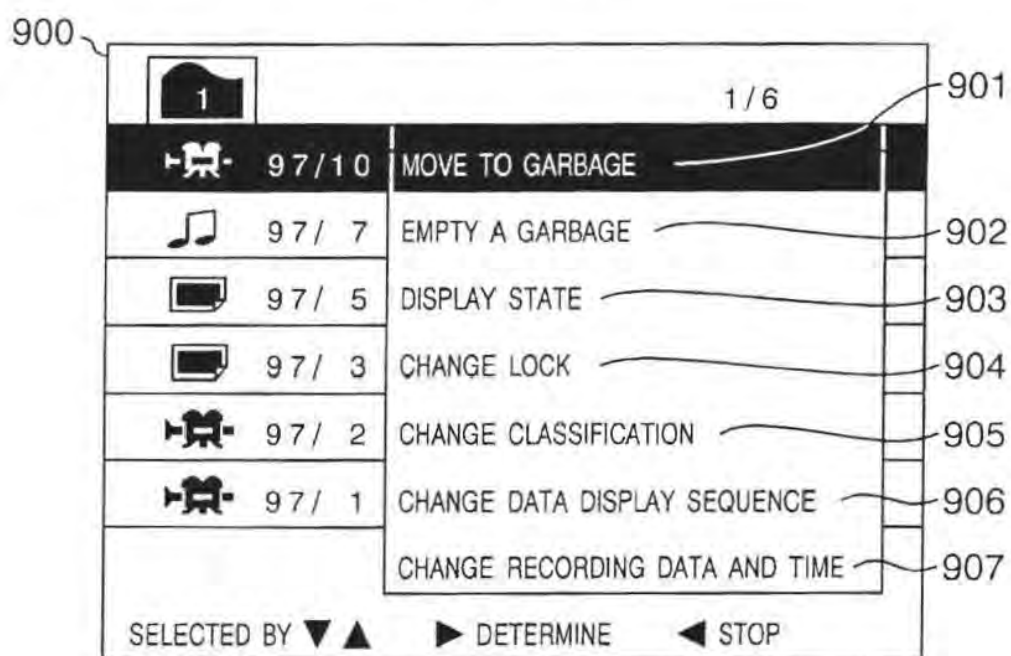


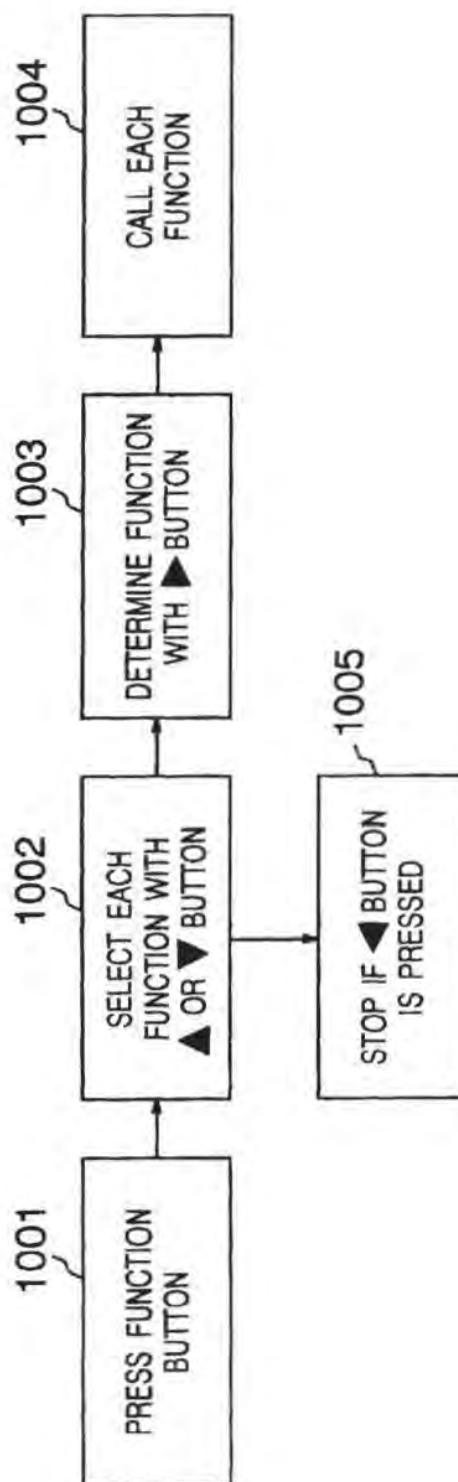
FIG. 9



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**FIG. 10**

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**A50750**

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FIG. 11

1100

































			1 / 6
	97/10/21	AM11 : 41	
	97/ 7/ 5	PM 3 : 20	 
	97/ 5/ 1	AM10 : 35	
	97/ 3/12	PM 1 : 15	 
	97/ 2/ 5	PM 3 : 20	
	97/ 1/ 1	AM 9 : 18	 
SELECTED BY ▼ ▲ ► CHANGE ◀ RETURN			

FIG. 12

1200

			1 / 6
	97/10/21	AM11 : 41	
	97/ 7/ 5	PM 3 : 20	 
	97/ 5/ 1	AM10 : 35	
	97/ 3/12	PM 1 : 15	 
	97/ 2/ 5	PM 3 : 20	
	97/ 1/ 1	AM 9 : 18	 
SELECTED BY ▼ ▲ ► DETERMINE DESTINATION ◀ RETURN			

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A50751

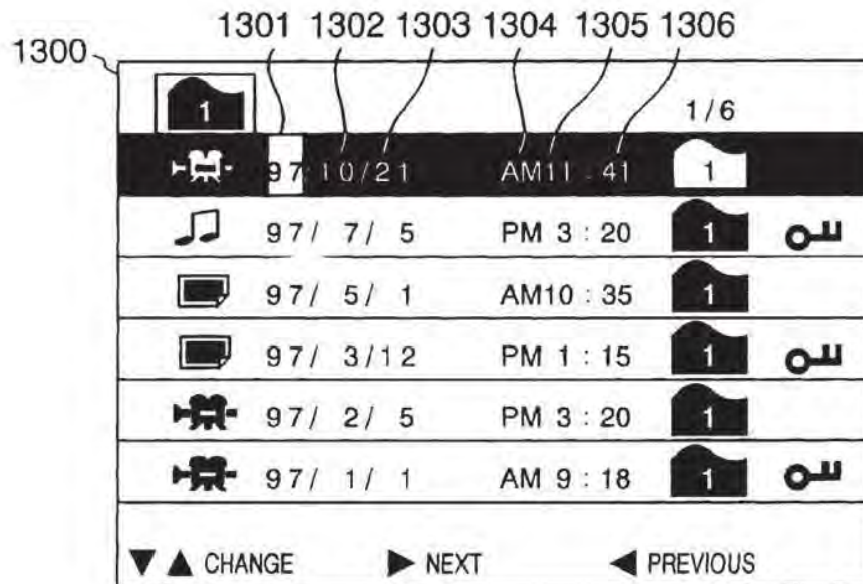
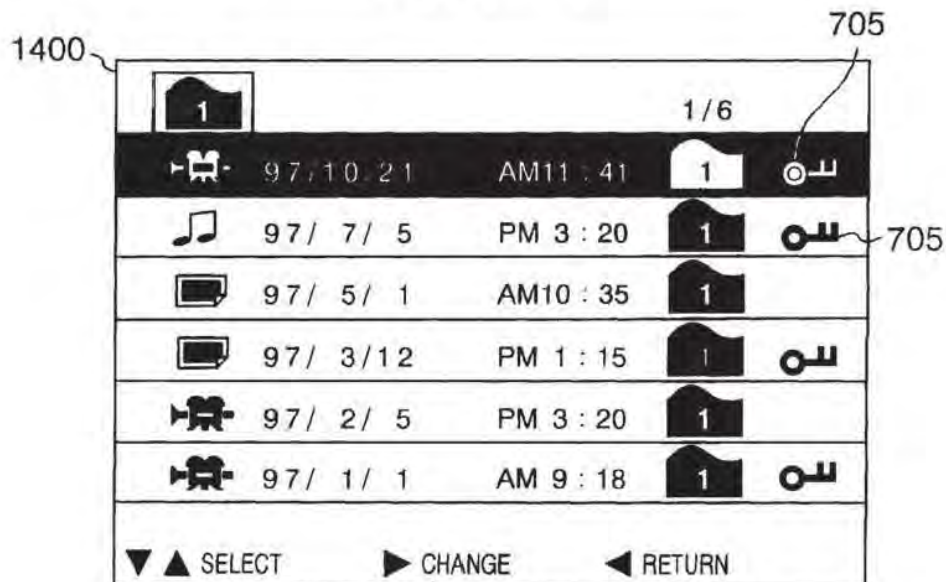
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**FIG. 13****FIG. 14**





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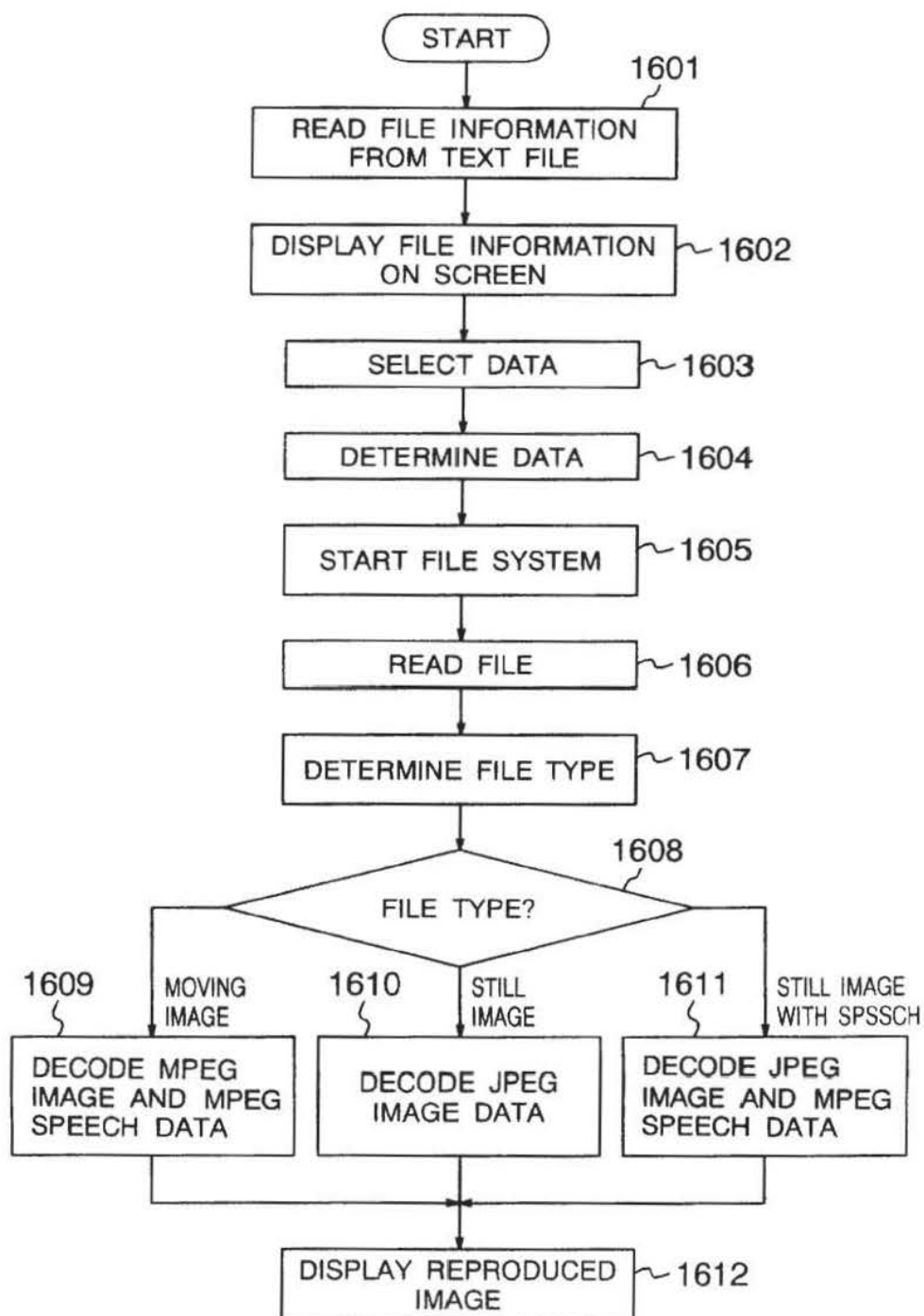
**A50752**

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FIG. 15

1500

STATE			
REMAINING VOLUME OF CARD			
	0 : 07	MINUTE	1501
	1 0 0 0	PAGE	1502
	0 : 45	MINUTE	1503
	2 1 0 M	BYTES	1504
◀ RETURN			

**FIG. 16**

SAMNDCA630-07887591

**A50754**

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FIG. 17

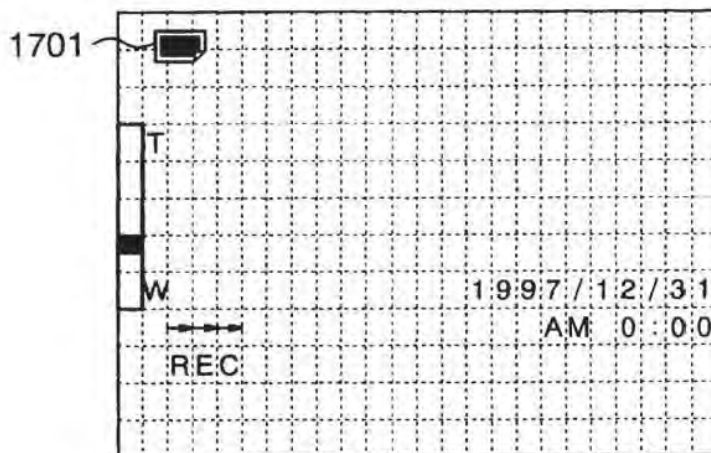
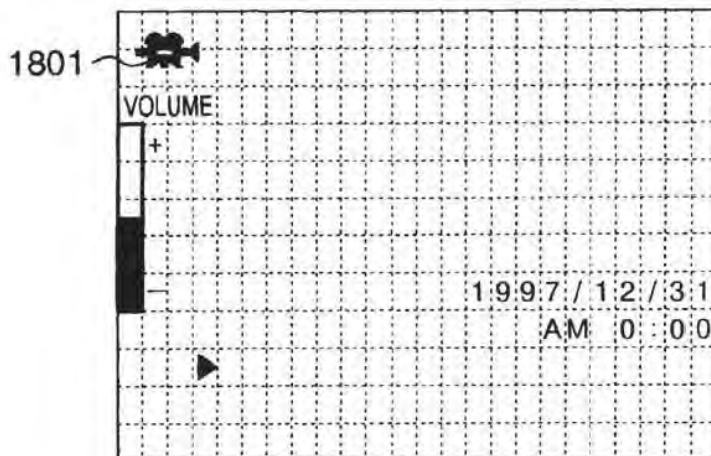






FIG. 18



**FIG. 19**

RECORDING MODE	MODE SYMBOL
MOVING IMAGE	
STILL IMAGE	
SERIAL STILL IMAGE	
STILL IMAGE WITH SPEECH	

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# APPARATUS FOR RECORDING AND REPRODUCING DIGITAL IMAGE AND SPEECH

## BACKGROUND OF THE INVENTION

The present invention relates to operativity of a portable digital camcorder.

The prior art relevant to the portable digital camcorder has been published as an electronic photograph system, that is, the so-called electronic still camera that is arranged to record a still image signal as a video signal in a memory composed of a semiconductor (termed as a semiconductor memory or simply a memory) as disclosed in JP-A-2-292974. With recent prevail of personal computers, recording mediums such as semiconductor memories and hard-disks are progressively made lower in cost, smaller in size, and greater in capacity. At a time, the advance of signal compressing technology such as JPEG or MPEG allows even the small-sized equipment to record greater number of still images and moving ones. Taking a harddisk drive as an example, the resulting harddisk drive is kept as small as a card and has as great a capacity as about 300 Mbytes.

This type of harddisk drive enables to record about 3000 still images through the use of the JPEG compression and about 20-minutes moving picture through the use of the MPEG compression. It is thus necessary to improve the operativity of the portable equipment for retrieving, grouping, and deleting a great deal of recording data. The technique disclosed in JP-A-2-292974, however, does not provide means for retrieving a great deal of recording data quickly and easily. In actual, therefore, the technique does not have any means except the method of retrieving the great deal of recorded data as checking all images reproduced on screen from the recorded data.

In case that 3000 JPEG still images are recorded on a feasible media such as the aforementioned harddisk drive and then are retrieved as expanding those images on the screen one by one, about one second for expanding one JPEG still image is required. It means that the expansion of 3000 images needs about one hour. This method lacks in practicability. In order to retrieve a great deal of data, therefore, it is necessary to enhance the operating speed of the system.

## SUMMARY OF THE INVENTION

It is an object of the present invention to provide an apparatus which is arranged to overcome the foregoing shortcoming and enhance the operativity even if the apparatus is small-sized.

In carrying out the object, for improving the operativity of a small-sized apparatus, the present invention is achieved by an apparatus which comprises recording means for recording both imaging time information and imaging mode information for distinguishing moving images from still images at a time when taking the still image or moving image, display means for displaying as a list the informations as well as expanded images on a liquid crystal display screen built in the main body of the apparatus itself, and keying means for retrieving, classifying, and erasing the recorded data.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagram showing a state transition of a program used in an apparatus according to the present invention;

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FIG. 2 is a view showing an outer appearance of a portable digital camcorder in which the program of FIG. 1 is executed;

FIG. 3 is an expanded view showing an operating switch portion provided in the portable digital camcorder in which the program of FIG. 1 is executed;

FIG. 4 is a circuit diagram showing an arrangement of a portable digital camcorder in which the program of FIG. 1 is executed;

FIG. 5 is a view showing a display screen provided in the portable digital camcorder in which the program of FIG. 1 is executed;

FIG. 6 is a view showing a display screen on which the recorded data is classified;

FIG. 7 is a view showing a display screen on which the recorded data is selected;

FIG. 8 is a view showing a display screen with expanded images in which the recorded data is selected;

FIG. 9 is a view showing a display screen on which the function details of the recorded data are selected;

FIG. 10 is a flowchart showing a method for selecting the function details;

FIG. 11 is a view showing a display screen on which the classifications of the recorded data are changed;

FIG. 12 is a view showing a display screen on which the displaying sequence of the recorded data is changed;

FIG. 13 is a view showing a display screen on which each date of the recorded data is changed;

FIG. 14 is a view showing a display screen on which each erasing attribute of the recorded data is changed;

FIG. 15 is a view showing a display screen on which a remaining state of the recording medium is displayed;

FIG. 16 is a flowchart showing a method for reading recorded data from a harddisk driver and reproducing it;

FIG. 17 is a view showing an imaged screen appearing if a still image recording mode is selected when recording an image;

FIG. 18 is a view showing an imaged screen appearing if a moving image recording mode is selected when recording an image; and

FIG. 19 is a view showing marks for modes;

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

Later, the description will be oriented to the embodiments of the present invention with reference to FIGS. 1 to 19.

FIG. 1 shows a flow of a software program according to an embodiment of the present invention.

The software program shown in FIG. 1 flows through the process of selecting a classification containing data to be played back or handled (101) and reaches the process of playing back the data (103) or flows to a function selecting items (105) in which a temporary discard (106), a complete abandon (107), a state display (112) of a storage unit, setting of protection from erasion (111), change of a display list (109), or change of a record date and hour (110) is selected. Moreover, when selecting a classification (101), the flow goes to the function selecting items (105) in which a temporary discard (106), a complete abandon (107), a state display of a storage unit (112), or automatic playback is selected. In the playback (103), a move to next data (115), a move to previous data (116), a fast playback (117), a rewind playback (118), or a temporary stop (121) is selected.

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In the temporary stop (121), a forward frame advance (119) or reverse frame advance (120) is selected.

FIG. 2 shows an example of an outer appearance of a portable digital camcorder 200 in which the software program shown in FIG. 1 is executed. This camcorder 200 provides a capability of recording and reproducing an NTSC or PAL TV system signal.

FIG. 3 is an expanded view showing an operating switch portion of the portable digital camcorder shown in FIG. 2. In the portable digital camcorder 200 shown in FIG. 2, with the operating switches, a digital moving signal obtained from the camera system is compressed to one MPEG (Moving Picture Expert Group) format and then is recorded on a harddisk storage medium sized to a memory card. In the playback, with the operating switches, the MPEG1 format signal recorded in a memory card is expanded and then displayed on a display unit 201 built in the camcorder itself. The display unit may be connected to the outside of the camcorder 201. The portable digital camcorder 200 shown in FIG. 2 may recorded the MPEG moving image data as well as the JPEG data for the still images and the MPEG speech format for the speech data.

FIG. 4 schematically shows a circuit arrangement of the portable digital camcorder 200. At first, the description will be oriented to the procedure of recording the moving image through the portable digital camcorder 200. When a user presses a recording switch 301, an image of an object obtained through a lens 401 is converted into the corresponding electric signal through the effect of a CCD sensor 402. The signal read out of a sensor is electrically processed through a CDS (Correlated Double Sampling) circuit for suppressing the low-frequency noises of the signal and a circuit 403 integrated with a AGC circuit for controlling an automatic gain of the signal for stabilizing the signal level. Then, the processed signal is converted into a digital signal through an ADC 404 and then is applied to a camera signal processing circuit 405.

A camera signal processing circuit (camera DSP) 405 is configured of a function of converting a digital pixel signal from the sensor into a luminance signal Y and color difference signals U and V, a function of adding a synchronous signal, a function of controlling relation between an iris and a shutter speed, a function of adjusting a white balance, and a function of digitally zooming in or out the signal. Though not illustrated in detail in FIG. 4, the camera DSP 405 is operated to feed a horizontal and a vertical driving signal pulses to the CCD sensor 402 and read the signal from the CCD sensor 402 as adjusting the timing between the synchronous signal and the pulses. Moreover, a camera control microcomputer 406 is operated to feed operating parameters for the DSP 405 to the camera DSP 405 in order to control the overall camera system.

On the other hand, the digital luminance signal Y and the digital color difference signals U and V obtained by the camera DSP 405 are sent to an MPEG1 encoder 409 through a digital bus line. The MPEG1 is a standard compression format for the digital signal for a moving image. The encoder 409 operates to compress the data according to the MPEG1 format and then convert it into the digital data. A numeral 410 denotes a working memory used in encoding the data according to the MPEG1 format. The data converted into the MPEG1 format is sent to a microcomputer 411 for controlling a transmission rate of the digital output data. The MPEG1 encoder 409, the working memory 410 and the microcomputer 411 compose the overall system for compressing the moving image.

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The microcomputer 411 for controlling the transmission rate stores a constant amount of MPEG1-formatted data in a buffer memory 412. The formatted data is passed through an interface circuit 413 and a card connector 414 and reaches a harddisk drive 415. The card connector 414 is configured on the PCMCIA standards and thus contains 68 pins. The harddisk drive 415 is sized to a memory card and subject to the PC card standards defined by the PCMCIA (Personal Computer Memory Card International Association).

The foregoing description has concerned with the method for recording the moving image. In case the still image recording mode is selected by the user, the MPEG encoder 409 is switched to a JPEG compressing circuit. Then, a still image data is generated at the encoder 409 and then transferred to the microcomputer 411 for doing the same operation as described above. The MPEG compression data process and the JPEG compression data process have the same common points, so that the use of both the data formats may effectively save the circuit scale. This is a well-known method for saving the circuitry.

Further, the speech signal is converted into an analog electric signal through a microphone 418. The analog electric signal is sent to a speech ADC 419 for converting the analog electric signal into the corresponding digital data. The digital speech data is applied into the data bus through the effect of the MPEG encoder 409. Then, the microcomputer 411 performs the MPEG-format-based compression through the program run therein so that the digital speech data is added to the moving image data or the still image data in precise time sequences.

According to this embodiment, the portable digital camcorder 200 is arranged to record the MPEG1-formatted data, the JPEG-formatted data, and the MPEG1-formatted speed data.

In recording the data, the microcomputer 411 also enables to record a data, a time, and a symbol for representing any one of the MPEG1-formatted data, the JPEG-formatted data, and the MPEG1-formatted data on a time when the recording switch 301 is pressed. At a time, the microcomputer 411 enables to record a symbol for representing a classification for retrieving the recorded data and a symbol for representing whether or not the operation of erasing the recorded data is prohibited. In recording the data, the classification symbol is recorded as "not classified" and the deletion symbol is recorded as "erasable".

In the general disk operating system, the symbol for indicating the imaging mode is discriminated using a code for a data type. The symbol for representing the classification and the symbol for representing if the data is erased are recorded in the corresponding files.

On the other hand, when recording the data, a digital signal applied to the camera DSP 405 as a monitoring signal is converted into an analog TV signal through the effect of an NTSC or PAL encoder built in the circuit 405 and then is fed at an output terminal 416 and the built-in display unit 201. The foregoing description has concerned with the MPEG1-formatted moving image data with the speech. In actual, the JPEG-formatted data or the MPEG1-formatted speech data may be solely processed in the similar manner to the above operation.

When the system stays at the playback mode, the signal flows in an opposite manner to the flow at the recording mode. FIG. 16 is a flowchart showing the reproduction of the signal. Text data indicating information of data is read from the harddisk drive 415 (step 1601). Next, the user retrieves data from a list of data displayed on the built-in display unit

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201 and specifies the data to be played back with the operating switch 408 (step 1604). The list of the recorded data displayed on the display unit 201 is a feature of the invention. With the specification, a file system is started (step 1605) so that the data is read out of the harddisk drive 415 and then sent to the microcomputer 411 (step 1606).

Then, the data type is discriminated (steps 1607 and 1608). If the recorded data is the moving image, the MPEG-formatted moving image data and the MPEG-formatted speech data are both decoded (step 1609). If the recorded data is the still image, the JPEG-formatted still image data is decoded (step 1610). If the recorded data is the still image with the speech, the JPEG-formatted still image data and the MPEG-formatted speech data are both decoded (step 1611). Then, the decoded image and the decoded speech if any are displayed on the screen (step 1612).

An indication signal issued by the operating switch 408 is read by a sub-microcomputer 407 and then is sent to the microcomputer 411 through a camera-controlling microcomputer 406. The software program according to this embodiment is read out of a ROM 417 (Read-only Memory) for storing a program and then is executed. In this embodiment, the program is stored in the ROM 417. In place of the ROM 417, another storage unit such as a flash RAM or a harddisk drive may be used for the purpose.

Next, the data is transferred to the buffer memory 412 through the PCMCIA connector 414 and the interface circuit 413. The timing of the data stored in the buffer memory 412 is controlled by the microcomputer 411. Then, the data whose timing is adjusted is sent to the MPEG1 decoder 409. The decoder 409 switches the MPEG1 coding to the MPEG1 decoding or vice versa.

The data decoded by the MPEG1 decoder 409 is sent to the camera DSP circuit 405 through the digital path line. The decoded data is converted into an analog video signal through the effect of an NTSC or PAL encoder and a DAC built in the circuit 405 and then is led at an output terminal 416 and from the built-in display unit 201 to the outside of the apparatus. The foregoing description has concerned with the MPEG1-formatted moving picture data with the speech. The JPEG-formatted still image data or the MPEG1-formatted speech data may be solely processed in the same manner as described above.

The portable camcorder of this embodiment is arranged to use a harddisk unit of 260 MB for the harddisk drive 415. In case that only the JPEG-formatted still image data is recorded, about 3000 still images may be recorded. In actual, the portable camcorder of this invention enables to retrieve 3000 items of data quickly and easily using the classifying function.

FIG. 4 shows a circuit arrangement about the moving image. The corresponding circuit arrangement to that of FIG. 4 is required for the still images and the speech. That is, the portable camcorder of this embodiment is arranged to have a general-purpose means for imaging a moving object/a still object, a microphone, means for digitally converting a moving image/a still image, means for digitally converting speech, and means for digitally recording a moving image, a still image, and a speech signal.

FIG. 5 shows the screen of the built-in display unit 201 used in the embodiment of the invention, in which the diagonal length is 1.8 inch (45.7 mm), the horizontal length is 36.6 mm, and the vertical length is 27 mm. The illustrated screen arrangement uses a liquid crystal consisting of 352 pixels and 240 pixels. In order to reduce the power consumption and the size of the portable digital camcorder 200,

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the 1.8-inch liquid crystal is used for the built-in display unit 201. This built-in display unit 201 shows an imaging screen formed by a monitoring signal when recording the signal, a retrieval screen formed by the program when retrieving the data, and a playback screen formed by the decoded data when playing back the data.

In recording the data, the moving image recording mode (MPEG compression recording mode) or the still image recording mode (JPEG compression recording mode) may be switched each time the mode selecting button is pressed. As the user can select the recording mode with this button, as shown in FIGS. 17 and 18, the mark for each mode located in the upper left portion of the imaging screen is switched each time the mode is switched.

FIG. 17 shows the imaging screen appearing when the still image recording mode is selected when recording data. In FIG. 17, a numeral 1701 denotes a mark representing a still image mode. FIG. 18 shows the imaging screen appearing when the moving image recording mode is selected when recording data. In FIG. 18, a numeral 1801 denotes a mark representing the moving image mode. The mark for each mode appears on the screen so that the user can visually recognize the current imaging mode as he or she is pushing the mode selecting button. This mark allows the user to handle the camcorder without having to keep his eyes out of the imaging screen. It means that the digital camcorder offers convenient operativity to the user.

The mark for each mode is displayed on the retrieving screen through the effect of the program sent from a data containing unit. The retrieving screen will be discussed in detail together with the display of the mode mark. FIG. 19 shows the concrete mark for each mode. In actual, however, the marks are not limited to the illustrative ones. Any mark may be used if it can distinguish the modes from each other.

In FIG. 5, the display screen 500 consists of 20×9 characters at maximum, each character consisting of 16 and 24 pixels. The character size consisting of 16×24 pixels keeps the maximum recognizable size compatible with efficient digitizing of the character data. The blanks of a left side 501, a right side 502, an upper side 503, and a lower side 504 of the screen are secured because the display unit or the built-in display unit 201 connected to an output terminal 416 disables to display the overall area of the main screen.

A numeral 505 denotes an operating state display area where the operating state of the program of this embodiment is displayed. A numeral 506 denotes an area where the information of the recorded data and the functions to be operated for specifying the data details of the data by pressing a function switch 304 are displayed as individual items in partitioned sub-screens. A numeral 507 denotes an area where an operating procedure suggests the operating method to the user.

FIG. 6 shows a display screen 600 appearing when a program starting switch 303 is pressed by the user for starting the program of this embodiment. The display screen 600 corresponds to a classifying selection 101 of FIG. 1 for indicating the state transition of the operation. As mentioned earlier, the data recorded by the user is unconditionally recorded "unclassified" when recording the data. The figure (number of files) displayed on the "unclassified" row stands for the number of MPEG1-formatted moving image data items with the speech 602, the number of JPEG-formatted still image data pieces 603, and the number of MPEG1-formatted speech 604.

Likewise, the figure displayed on each row of a mark 605 for indicating the first classification, a mark 606 for indi-

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ating the second classification, and a mark **607** for indicating the third classification indicate the numbers of data items arbitrarily classified by the user, respectively. A mark **608** for indicating all data items at a batch indicates the total number of the data items on the "unclassified" row **601**, the "first classified" row **605**, the "second classified" row **606**, and the "third classified" row **607**.

A mark **609** for indicating the "temporary discard" means a classification for temporarily discarding the data items so that the user cannot erroneously erase the data items. With the mark **609**, the user can temporarily move the "unclassified", "first classified", "second classified", and "third classified" data items to the "temporary discard" row. The figure represented on the row of the mark **609** does not contain a figure represented on the row of the mark **608** for indicating all data items at a batch.

In FIG. 6, the row of the mark **601** for indicating the unclassification is reversed to the rows of the other marks. It indicates that the mark **601** for indicating the unclassification is the selected item. In place of the reversing, another kind of way may be used such as change of a color. The software program is executed by the user so that the recorded data items whose classifying destinations are not changed are contained in the row of the mark **601** for indicating the unclassification.

When the upper arrow switch **305a** of FIG. 3 is pressed by the user, the selected item is shifted upward by one row, while the lower arrow switch **305c** is pressed, the selected item is shifted downward by one row.

In case that the selected item is an item on the first row of the display area **506**, that is, on the mark **601** for indicating the unclassification, when the user presses the upper arrow switch **305a**, the selected item is shifted to the item on the sixth row of the display area **506**, that is, on the mark **609** for indicating the temporary discard. In case that the selected item is an item on the sixth row of the display area **506**, that is, on the mark **609** for indicating the temporary discard, when the user presses the lower arrow arrow **305c**, the selected item is shifted to the item on the first row of the display area **506**, that is, on the mark **601** for indicating the unclassification.

When the user presses the right arrow switch **305b**, the display screen is shifted into the screen on which the content of the classification of the selected row is represented.

Moreover, the guide indication **610** for the operating procedure is displayed so as to remind the user of the operation.

As an example, FIG. 7 shows a display screen **700** on which the mark **605** for indicating the first classification is selected so that the data items on the row of the mark **605** appear as ones to be selected if the right arrow switch **305b** is pressed by the user. This function corresponds to the data selection **102** shown in FIG. 1.

The display screen **700** is a screen on which a data item is to be retrieved from a data list and played back. The data list is a feature of the present invention. On the screen **700**, the data items recorded by the portable digital camcorder **200** may be listed using a mark **703** for representing a sort of data content of a recording start time **702**, a moving image, a still image, and a speech, a classifying mark **704**, and a mark **705** for protecting data from being erased by the erroneous operation.

The data items displayed on the screen **700** are ranged from the top to the down in the sequence of the recording year/month/day **701** and the recording start time **702**. Hence, the latest recorded data is listed on the topmost row, so that

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the user can effectively retrieve the data. The number of the pages of the displayed lists is checked, so that the lists are displayed as pages as indicated by a numeral **707**. In the page display **707**, a denominator indicates all the list pages, while a numerator indicates the current one of the list pages.

The imaging status of the user such as the recording date and time and the data type are automatically recorded as the aforementioned information, so that the user can manually record these pieces of information. Since the user may optionally change the classifying destination according to his or her purpose, the user's retrieval work for the destination data is made simpler and more efficient.

These pieces of information are all composed of a list represented in characters. This does not need a time consumed in expanding the compressed image data recorded on the media. Further, if the user selects a data item using the operating button, the screen can be rewound quickly, so that the quick retrieval is made possible.

This list retrieving operation may offer comfortable operativity without having to impose stress on the user who wants to quickly select the recorded image.

The selecting classification **706** indicates a classification selected by a display screen **600**. This embodiment has concerned with the user's selection of the first classification **605** on the display screen **600**.

The display list of the data items on the display screens **700** and **800** is arranged in the sequence of recording the data on the harddisk drive **415**, that is, in the sequence that the latest data item comes to the topmost row. Since the user may change the sequence of recording the data items on the harddisk driver **415**, he or she may change the display sequence. The data immediately after imaging is recorded on the topmost row (**701** of FIGS. 7 and 8) of the display area **506** on the unclassified data selecting screen. If the user makes sure of the just imaged data, he or she only reproduces the data and makes sure of the topmost row of the display area **506** on the unclassified data selecting screen.

Like the display screen **600**, when the user presses the upper arrow switch **305a**, the selected data item is shifted upward by one row. When the user presses the lower arrow switch **305c**, the selected data item is shifted downward by one row. In this embodiment, the six rows of the data items are displayed on one screen. In case the user selects the sixth data item, if the lower arrow switch **305c** is pressed, the seventh data item is displayed on the first row of the display area **506**. It means that the seventh data item is the selected item. The eighth, the ninth and the following data items are displayed on the second, the third, and the following rows, respectively.

On the other hand, for example, in case the seventh data item is selected, if the upper arrow switch **305a** is pressed, the seventh data item is displayed on the first row of the display area **506**. The second, the third, the fourth, the fifth, and the sixth data items are respectively displayed on the rows after the first one, so the selected data item is changed to the sixth data item.

That is, the n-th data item is displayed on a remainder-th row on the display area **506**, in which the remainder is obtained by dividing n by 6.

In case the head data item or the tail one is selected, if the upper arrow switch **305a** or the lower arrow switch **305c** is pressed, like the display screen **600**, the data items containing the head and the tail items are displayed as a list so that the head or the tail data item is selected. Though FIG. 6 shows the one-page screen on which the number of folders is fixed, FIGS. 7 and 8 show the screen on which the pages

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are increased or decreased in number according to the number of data items.

If the user selects the upper arrow switch 305a and the lower arrow switch 305c shown in FIG. 3 and depresses the right arrow switch 305, the selected data is fed out of the output terminal 416 and is played back on the built-in display unit 201.

While the data is being played back, the upper arrow switch 305a, the lower arrow with 305c, and the left arrow switch 30, as shown in FIG. 3, are served as fast feed, rewind, and stop, respectively. While the data is being played back, if the left arrow switch 305d served as a stop switch is pressed by the user, the playback is stopped, and the display screen 700 is displayed again. The state transition during the data playback is denoted by a numeral 103 of FIG. 1.

Next, the description will be oriented to the display content on which reduced images are added to the recording date and time so that the content of the data may be easily recognized. In the state of the display screen 700, if the user presses the reduced image display switch 302, a reduced image 801 of the first frame of the data listed on the subject row is displayed on the display screen 800 shown in FIG. 8. This makes it possible to surprisingly enhance the retrieval of the data. The state transition in the reduced image display function is denoted by a numeral 104 of FIG. 1.

For example, in case that the viewable area of the 1.8-inch built-in LCD display unit 201 consists of 379 dots in horizontal and 220 dots in vertical, the reduced image 801 is adjusted to consist of 64 dots in horizontal and 48 dots in vertical. (if the LCD panel consists of 352 and 240 dots, the reduced image 801 consists of  $240/48=5$  dots in vertical and  $352/5=70.4$  in horizontal. From a vertical viewpoint, the reduced image is one-fifth and from a horizontal viewpoint, the reduced image is one-fifth with a slight margin.) In this reduction, three reduced images, the recording starting year month day 701, the recording starting time 702, the mark 703 representing the content type of the data indicating the moving image, the still image, and the speech, the classification mark 704, and the mark 705 for protecting the data from being erroneously erased can be all displayed on one screen. This screen arrangement makes it possible to secure more visible reduced images on the display. Like the display screen 700, on this display screen 800, the data may be played back by pressing the operating button 305 and the like.

In this state, if the reduced image display switch 302 is pressed again, the display screen is returned to the display screen 600 for displaying the data classification. The reduced image is depicted in the RAM 410 shown in the circuit block of FIG. 4 through the effect of the control microcomputer 411 and the MPEG encoder 409.

In turn, the description will be oriented to a function selecting display screen 900 for easily changing the display state from the data selecting display screen 700. The function selecting display screen 900 includes the reduced number of operation switches and function items displayed thereon so that the ease of use in operation may be improved as viewing the screen. The operating switches 304, 305a, 305b, 305c, and 305d shown in FIG. 3 implement the operating system for selectively operating the function. The state transition on the display screen 900 is denoted by a numeral 105 of FIG. 1.

On the reduced image display screen 800, the function selecting display screen 900 is displayed by the same procedure. On the display screen 600, the display screen

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having the necessary functions such as "empty a garbage", "move to a garbage", "display a state", and "auto play" shown in FIG. 1 is displayed by the same procedure. In this case, the function items on the display screen 900 are not required to be identical with the function items on the data classifying display screen 600.

The flow of operation on the display screen 900 is shown in FIG. 10. The display screen 900 is displayed when the user pressed the function switch 304 on the display screen 700 (step 1001). The selective movement of each item is indicated by the upper arrow switch 305a and the switch lower arrow switch 305c. If the user pressed the upper arrow switch 305a, the selected data item is moved upward by one row. If the lower arrow switch 305c is pressed, the selected data item is moved downward by one row (step 1002). If the user presses the right arrow switch 305b (step 1003), the function of the selected data item is executed (step 1004). If the left arrow function switch 305d is pressed, the display screen 900 is returned to the data selecting display screen 700 (step 1005).

As mentioned earlier, in this embodiment, the erasure of the data is realized by moving the data to the temporary discard location and then erase the data contained in the temporary discard location. The state transition of this function is denoted by a numeral 106 of FIG. 1.

The procedure of erasing the data will be described below.

If the data is erased, the data is moved to the temporary discard location. In this case, the procedure for selectively executing "move the data to a garbage" will be described with reference to FIG. 9.

At first, on the display screen 700, the user selects the data item to be temporarily discarded with the upper arrow switch 305a and the lower arrow operating switch 305c and then depresses the function switch 304. Then, the display screen 700 is changed to the display screen 900. The user selects the "move data to a garbage" 901 with the upper arrow operation switch 305a and the lower arrow function switch 305c and then depresses the right arrow switch 305b. Then, the selected data item is moved to the garbage that is the temporary discard location. If the user presses the switch 306, the similarly selected data is moved to the garbage.

When the user selects the "empty a garbage" 902 on the display screen 900, all the data items left in the garbage are erased. The state transition of this function is denoted by a numeral 107 of FIG. 1.

In the operating system, the user is required to do two operations for erasing the data. The two operations protect the data from the user's erroneous erasure.

As mentioned earlier, when recording the data, the classifying symbol to be allocated to each data item is an unclassified one. When playing back the data, the classification may be changed by the user's operation. This classifying function is used for classifying the data item. Hence, since the user classifies the data item for each destination, the ease of use of the retrieval may be surprisingly enhanced. The state transition of this function is denoted by a numeral 108 of FIG. 1.

Later, the description will be oriented to the procedure for changing the data classification. On the display screen 700, the user selects the data item whose classification is to be changed with the upper arrow switch 305a or the lower arrow operation switch 305c and then presses the function switch 304. Then, the display screen is changed to the display screen 900. The user selects the "change a group" 905 that is a function of changing the classification with the upper arrow operation switch 305a and the lower arrow

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operation switch 305c and then presses the right arrow switch 305b. Then, a display screen 1100 is displayed on which the classification of the selected data shown in FIG. 11 is changed.

If the right arrow switch 305b is pressed on the display screen 1100, the classification is cyclically changed from "unclassification" to 1 to 2 to 3 to "unclassification". In this embodiment, the update of the symbol for the classification according to the display screen is executed by the control microcomputer 411 at a time when the user presses the left arrow switch 305d and the display screen 600 appears. This is intended for enhancing the processing speed and retrying the user's operation.

As described earlier, unless the user does the following operation, the list indicated on the display screen 700 is arranged in the recording sequence of the recorded data. When playing back the data, the sequence may be changed so as to implement a simple editing function. The state transition of this function is denoted by a numeral 109 of FIG. 1.

The procedure of changing the data displaying sequence will be described below. At first, on the display screen 700, the user selects the data item whose displaying sequence is to be changed with the upper arrow switch 305a and the lower arrow switch 305c. Then, if the function switch 304 is pressed, the display screen 900 is displayed.

The user selects the "change a data display sequence" 906 that is a function of changing the display sequence with the lower arrow switch 305c and depresses the right arrow switch 305b. Then, the display screen 1200 shown in FIG. 12 is displayed, so that the display sequence of the selected data item may be changed. Next, the user specifies the location where the selected data is to be inserted with the upper arrow switch 305a and the lower arrow switch 305c. Then, if the right arrow switch 305b is pressed, the selected data item is inserted to the specified location. In this case, the sequence of the data item located after the specified location is shifted lower by one.

The portable digital camcorder 200 of this embodiment incorporates an internal clock for displaying on the display screen 700 the date and the time when the data is recorded. However, if failure such as run-down of a battery takes place while imaging an object, the recorded data and time may not be correctly displayed on the display screen 700. In this embodiment, the user may operate to optionally change the date and time when the data is recorded. The state transition of this function is denoted by a numeral 110 of FIG. 1.

Later, the description will be oriented to the procedure for changing the date and time. The user selects the data whose recording date and time are to be changed using the upper arrow switch 305a and the lower arrow switch 305c. Then, if the function switch 304 is pressed, the display screen 900 is displayed. The user selects the "change a recording date and time" 907 that is a function of changing the displaying sequence with the upper arrow switch 305a and the lower arrow switch 305c. Next, if the right arrow switch 305b is pressed, the display screen 1300 shown in FIG. 13 is displayed where the recording date and time of the selected data are to be changed.

In this state, when the user pressed the upper arrow switch 305a, the year figure 1301 is increased by 1, while the lower arrow switch 305c is pressed, the year figure 1301 is decreased by 1. When the right arrow switch 305b is pressed, the year figure 1301 is determined as a numeric value represented at the time point. Next, the user may specify the increment or decrement of the numeric value of a month figure 1302.

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Likewise, if the upper arrow switch 305a is pressed, the month figure 1302 is increased by 1, while if the lower arrow switch 305c is pressed, the month figure 1302 is decreased by 1. If the right arrow switch 305b is pressed, the month figure 1302 is determined as a numerical value displayed at the time point. Next, the user may specify the increment or decrement of a numerical value of a day figure 1303.

Further, when the left arrow switch 305d is pressed, the year figure 1301 may be retried. The similar operation may be executed to set the day figure 1303, an a.m or p.m. indication 1304, a time figure 1305, and a minute figure 1306. After adjusting a value of the minute figure 1306, if the right arrow switch 305b is pressed, the change of the recording date and time is terminated and the date and time of the data is changed to a new numeric value.

In the case of specifying a numeric value that does not exist in the calendar such as February 30, the numeric value is changed to the nearest date (that is, March 1) to the value.

In this embodiment, though the user can freely erase the data, the user may provide the data with an attribute of prohibiting the erasure for preventing the data from being erased. The state transition of this function is denoted by a numeral 111 of FIG. 1.

Later, the description will be oriented to the procedure for adding the attribute of protecting the data from the erasure to the data. At first, on the display screen 700, the user selects the data whose erasing attribute is to be changed with the upper arrow switch 305a or the lower arrow switch 305c. Then, the function switch 304 is pressed, so that the display screen 700 is changed to the display screen 900. The user selects the "change a lock" 904 that is a function of changing the erasing attribute with the upper arrow switch 305a or the lower arrow switch 305c. Then, if the right arrow switch 305b is pressed, the display screen 1400 is displayed where the erasing attribute of the selected data shown in FIG. 14 is changed.

When the user pressed the right arrow switch 305b, the erasing attribute is cyclically changed from "disabled" to "enabled" to "disabled". The protecting mark 705 is displayed or not displayed according to the erasing attribute.

In this embodiment, the user can know the remaining volume of the harddisk drive 415. The state transition of this function is denoted by a numeral 112 of FIG. 1.

Hereafter, the description will be oriented to the procedure for checking the remaining volume of the harddisk drive 415. On the display screen 700, if the user presses the function switch 304, the display screen 700 is changed to the display screen 900. The user selects the "display a state" 903 that is a function of changing the displaying sequence with the upper arrow switch 305a or the lower arrow switch 305c. Then, if the right arrow switch 305b is pressed, the display screen 1500 is displayed where the remaining volume of the harddisk drive 415 shown in FIG. 15 is shown.

On the display screen 1500, a remaining time 1501 left if only the MPEG1-formatted moving image data with the speech is recorded on the harddisk drive 415, a remaining pages left if only the JPEG-formatted still image data is recorded, a remaining time 1503 left if only the MPEG1-formatted speech data is recorded, and a remaining volume 1504 represented in bytes are all displayed as a list. Since the remaining volume of the harddisk drive is listed with respect to each recordable data type, the user can more easily grasp the remaining volume of the harddisk drive 415.

In this embodiment, when playing back the data, the user needs to use only the switches 305a, 305d, 305c and 305d for playing back the data. It is epoch-making that the

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minimum number of operating switches are just required for playing back the data.

Another epoch-making point is the increase of the functions without increasing the operating buttons by using the functional selecting screen 900.

In this embodiment, as shown in FIG. 6, the classified number of data items is four including "unclassified". The classified number of data may take any value. On the data selecting display screen 700, the data items may be displayed as a list independently of the types of the moving image, the still image, and the speech. This embodiment may apply to the function of automatically classifying the data according to the data type with the user's specification.

Moreover, the control microcomputer 411 is operated to automatically select the data according to the imaging modes such as the moving image and the still image. For example, the user can select only the imaging mode for the still image, pick up only the image type of the still image, and reproduce it.

The foregoing description has been concerned with the specific embodiments of the invention. The present invention may apply to the following arrangement.

For example, the present invention may be achieved by an image recording apparatus which includes converting means for converting a video signal into a digital signal, a codec unit for selectively performing a MPEG system or a JPEG system compression about the digital signal, for generating the compressed data, a recording unit for recording the compressed data, and a selective indicating means for a compression mode, for selectively indicating the MPEG system compression or the JPEG system compression.

This image recording apparatus may be applicably arranged to switch the compressing system of the codec unit according to the indication given by the selective indicating means.

Further, the image recording apparatus may be applicably arranged to add a code for indicating the compression system to the compressed data according to the indication given by the selective indicating means.

Further, the image recording apparatus may be applicably arranged so that the codec unit may be a circuit for performing the MPEG system and the JPEG system processing at one process.

Moreover, the image recording apparatus may be applicably arranged so that the video signal is obtained from an imaging element and the recording unit is a harddisk drive.

The present invention may be also achieved by the image reproducing apparatus which includes a recording unit for receiving compressed data generated according to the MPEG system or the JPEG system and recording the compressed data, specifying means for specifying a data item to be reproduced of the compressed data recorded in the recording unit, readout means for retrieving and reading out the compressed data specified by the specifying means from the recording unit, a codec unit for selectively performing the MPEG system or the JPEG system expansion about the compressed data and generating the digital signal, and converting means for converting the digital signal generated by the codec unit into a video signal.

Moreover, the image reproducing apparatus may be applicably arranged so that the expanding system of the codec unit may be switched according to the compressed data read out of the readout means.

Further, the image reproducing apparatus may be applicably arranged so that the compressed data of the recording

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unit pre-contains the code indicating the compressing system and the expanding system of the codec unit may be switched according to the code for indicating the compressing system added to the compressed data read out of the readout means.

Further, the image reproducing apparatus may be applicably arranged so that the codec unit may be a circuit for performing the MPEG system and the JPEG system expansion at one process, the video signal is output to the built-in display unit, and the recording unit may be a harddisk drive.

The present invention may be achieved by the image recording and reproducing apparatus for converting a video signal into a digital signal, recording the digital signal, converting the digital signal into the video signal, and reproducing the video signal, which includes a codec unit for selectively performing the MPEG system or the JPEG system compression about the digital signal for generating the compressed data in recording the data and selectively performing the MPEG system or the JPEG system expansion about the compressed data for generating the digital signal in reproducing the data, a recording unit for recording the compressed data, selective indicating means for the compressing mode for selectively indicating the MPEG system compression or the JPEG system compression, specifying means for specifying the data to be reproduced of the compressed data recorded in the recording unit, and readout means for retrieving and reading the compressed data specified by the specifying means from the recording unit.

Moreover, the image recording and reproducing apparatus may be applicably arranged so that the codec unit may switch the compressing system according to the indication given by the selective indicating means in recording the data or the expanding system according to the compressed data read out of the readout means in reproducing the data.

Further, the image recording and reproducing apparatus may be applicably arranged so that in recording the data, the recording unit adds the code for indicating the compressing system to the compressed data according to the indication given by the selective indicating means and records the compressed data and in reproducing the data, the codec unit switches the expanding system according to the code for indicating the compressing system added to the compressed data read out of the readout means.

Moreover, the image recording and reproducing apparatus may be applicably arranged so that the codec unit may be a circuit for performing the MPEG system and the JPEG system processing at one process, the video signal to be recorded is obtained from an imaging element, the video signal to be reproduced is output to the built-in display unit, and the recording unit is a harddisk drive.

As described above, as keeping the capacity of the recording medium larger and advancing the compressing technology, the data items to be recorded on one recording medium are increased in number. This embodiment, however, makes it possible to do the recording and the reproducing operations with quite few keys. Hence, this embodiment offers the below-indicated effects, so that it may improve the operativity even if it is applied to the small-sized apparatus with a limited space prepared for the operation buttons or switches.

This embodiment may display the recording date and time information and the marks for modes such as the moving image, the still image, and the still image with the speech as a list. Hence, the user can efficiently and quickly retrieve the data as grasping the content of the data. In recording the

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data, the marks are switchably displayed on the imaging screen each time the mode is switched so that the user can grasp the current imaging mode. Hence, the user can focus his or her attention onto the imaging screen at any mode when recording the data.

The display list is composed of a date and a time. The apparatus of this embodiment may automatically create the overall list and at once output the reduced images, so that the user can more easily grasp the content of the data.

The imaged data may be classified to the predetermined locations. Hence, the imaged data may be classified on the mode information and the date and time information according to the imaging statue and the object. This classification makes it easier for the user to retrieve the data.

Further, the displaying sequence of the list and the generating sequence of the data are allowed to be replaced depending on the mode information and the date and time information. Hence, the optimal reproducing effect can be obtained without having to depend on the recording sequence.

Then, the classification of "temporary discard" is provided for preventing the erasion of the data resulting from the user's erroneous operation and reusing the unnecessary data if it is made necessary after being deleted.

As described above, if the operation on the relatively simple graphic screen is executed to record a great deal of data, the function of this embodiment enables to offer quicker retrieval than the conventional function of reproducing the data as expanding all image screens.

What is claimed is:

1. A digital camera comprising:

a lens,

an imaging device which converts an optical image into an analog signal;

an A/D converter which converts the analog signal from said imaging device to a digital signal;

a compressor which compresses said digital signal outputted from said A/D converter, and generates compressed data by using a different compressing method for moving image signals than for still image signals;

a recording circuit which records compressed data, said compressed data including a moving image signal, and a still image signal;

a decompressor which decompresses said compressed data by using a different decompressing method according to whether said recorded compressed data is a moving image signal or a still image signal;

a reproducing circuit which reproduces a moving image signal, a sound signal in synchronous to said moving image signal, and a still image signal; and

a display which displays moving image signals and still image signals outputted from said reproducing circuit, and a list of said moving image signals and still image signals in a search mode;

wherein said recording circuit records recording information data for distinguishing a moving image signal from a still image signal and recording time data for indicating when an image is recorded, and said list of image signals displayed by said display in a search mode includes a plurality of marks for distinguishing a moving image signal from a still image signal and said recording time data corresponding to each displaying mark.

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2. A digital camera comprising:

a lens,

an imaging device which converts an optical image into an analog signal;

an A/D converter which converts the analog signal from said imaging device to a digital signal;

a compressor which compresses said digital signal outputted from said A/D converter, and generates compressed data by using a different compressing method for moving image signals than for still image signals;

a recording circuit which records compressed data, said compressed data including a moving image signal, and a still image signal;

a decompressor which decompresses said compressed data by using a different decompressing method according to whether said recorded compressed data is a moving image signal or a still image signal;

a reproducing circuit which reproduces a moving image signal, a sound signal in synchronous to said moving image signal, and a still image signal; and

a display which displays said moving image signals and still image signals outputted from said reproducing circuit, a list of said moving image signals and still image signals in a search mode, and a list of classifications in a classification mode;

wherein said recording circuit records an image signal with classification data and information data for distinguishing a moving image signal from a still image signal, and recording time data for indicating when an image is recorded, and

said display displays a plurality of classifications and a number of moving image signals, still image signals, still image with sound signals, distinguishably, belonging to each classification in said classification mode,

after selecting one classification in said classification mode by a user, said search display displays a list of a plurality of image signals belonging to the selected classification with a mark for distinguishing a moving image signal from a still image signal and a recording time corresponding to each mark.

3. A digital camera according to claim 1, wherein said recording information data includes recording time data for indicating when a image is recorded, and said display displays said recording time information corresponding to each displaying image signals.

4. A digital camera according to claim 1, wherein said recording time data indicates recording start date and recording start time.

5. A digital camera according to claim 1 or 2, said recording circuit records a sound signal in synchronous to said moving image signal and a sound signal in synchronous to said still image signal and recording information data for distinguishing a still image signal with a sound signal from a still image signal without a sound signal, and said display displays a mark for distinguishing a still image signal with still image signal with a sound signal from a still image signal without a sound signal corresponding to each displaying image signals.

6. A digital camera according to claim 1, wherein said recording information data includes reduced image data.

7. A digital camera according to claim 2, wherein said recording information data includes reduced image data, and said display displays plurality of said reduced image signal.

8. A digital camera according to claim 1, wherein said displays the information data recorded later on higher locations of the display screen.

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9. A digital camera according to claim 2, wherein said display displays the image recorded later on higher locations of the display screen.

10. A digital camera according to claim 8, wherein the display sequence may be changed by a user's direction.

11. A digital camera according to claim 7, wherein the display sequence may be changed by a user's direction.

12. A digital camera according to claim 1, wherein said display displays said mark and said recording time corresponding to each displaying mark on same row as graphic and literary notation.

13. A digital camera according to claim 2, wherein said display displays said image and said mark and said recording time corresponding to each displaying mark on same row as graphic and literary notation.

14. A digital camera according to claim 1, wherein said recording information data includes information indicating preventing erasion, and said display displays a mark indicating preventing erasion.

15. A digital camera according to claim 2, wherein said recording information data includes information indicating preventing erasion, and said display displays a mark indicating preventing erasion.

16. A digital camera according to claim 1, wherein said display displays at least one of function buttons which represent moving recorded data to a temporary discard area, erasing all data to a temporary discard area, changing a retrieving classification, changing display sequences, changing an erasing attribute, displaying a remaining volume.

17. A digital camera according to claim 2, wherein said display displays at least one of function buttons which represent moving recorded data to a temporary discard area, erasing all data to a temporary discard area, changing a retrieving classification, changing display sequences, changing an erasing attribute, displaying a remaining volume.

18. A digital camera according to claim 1, further comprising a storage medium; wherein display displays remaining volume of said storage medium.

19. An image recording and reproducing apparatus according to claim 1, wherein after one data of the plurality of data displayed in a search display is selected by an user, said display displays plurality of said image signal belonging to selected data.

20. A digital camera according to claim 2, wherein said recording circuit records image signal with classification data, and said display displays plurality of classification and a number of image belonging to each classification as a classification screen mode, and after directing one classification on said classification screen mode said by an user, said display displays plurality of said image signal belonging to selected classification with a mark for distinguishing a moving image signal from a still image signal.

21. A digital camera according to claim 2, wherein said display displays a number of each moving image, still image, still image with sound, distinguishably, belonging to each classification.

22. A digital camera according to claim 2, wherein said classification is able to change by a direction of a user.

23. A digital camera according to claim 2, wherein said display said classification including image without a direction of a user higher of a screen.

24. A digital camera according to claim 2, further comprising:

- a button for changing the display screen from said classification screen mode to a mode displaying said plurality of image,
- a button for selecting each recording data from a list of the recording data,

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a button for indicating a function of playing back stopping, fast feeding, and rewinding said image,

a button for changing said display screen for indicating the functions into display screen for indicating a recording mode,

wherein said buttons integrated same one button.

25. A digital camera comprising:

a lens,

an imaging device which converts an optical image into an analog signal;

an A/D converter which converts said analog signal from said imaging device to a digital signal;

a compressor which compresses said digital signal outputted from said A/D converter, and generates compressed data by using a different compressing method for moving image signals and for still image signals;

a recording circuit which records compressed data, said compressed data including a moving image signal, and a still image signal;

a decompressor which decompresses said compressed data by using a different decompressing method according to whether said recorded compressed data is a moving image signal or a still image signal;

a reproducing circuit which reproduces a moving image signal, a sound signal in synchronous to said moving image signal, and a still image signal; and

a display which displays said moving image signals and still image signals outputted from said reproducing circuit, and a list of said moving image signal and still image signal as a search mode, and a list of classifications as a classification mode;

wherein said recording circuit records each one of said plurality of image signals with classification data, and said display lists a plurality of classifications and a number of images belonging to each classification.

26. A digital camera according to claim 25,

wherein said display displays a number of each moving image, still image, still image with sound, distinguishably, belonging to each classification.

27. A digital camera according to claim 25, wherein said classification is able to change by a direction of a user.

28. A digital camera according to claim 25,

wherein said display said classification including image without a direction of a user higher of a screen.

29. A digital camera comprising:

a lens,

an imaging device which converts an optical image into an analog signal;

an A/D converter which converts said analog signal from said imaging device to a digital signal;

a compressor which compresses said digital signal outputted from said A/D converter, and generates compressed data by using a different compressing method for moving image signals and for still image signals;

a recording circuit which records compressed data, said compressed data including a moving image signal, and a still image signal;

a decompressor which decompresses said compressed data by using a different decompressing method according to whether said recorded compressed data is a moving image signal or a still image signal;

a reproducing circuit which reproduces a moving image signal, a sound signal in synchronous to said moving image signal, and a still image signal to a storage medium;

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a display which displays said moving image signal and still image signal outputted from said reproducing circuit;  
wherein said recording circuit records recording information data for distinguishing a moving image signal from a still image signal to said storage medium, and said display displays a remaining time if only compressed moving image data is recorded to said storage medium, a remaining pages if only compressed still picture image data is recorded to said storage medium, and a remaining volume of said storage medium as a remaining volume displaying mode.

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30. A digital camera according to claim 2, wherein after one data of the plurality of data displayed in a search display is selected, said display displays said image signal belonging to the selected data.

31. A digital camera according to claim 25, wherein after one data of the plurality of data displayed in a search display is selected, said display displays said image signal belonging to the selected data.

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**CERTIFICATE OF SERVICE**

I hereby certify that, on this 11th day of May, 2015 I filed the foregoing Non-Confidential Brief for Plaintiff-Cross Appellant Apple Inc. with the Clerk of the United States Court of Appeals for the Federal Circuit via the CM/ECF system, which will send notice of such filing to all registered CM/ECF users.

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## **CERTIFICATE OF COMPLIANCE**

Counsel for Plaintiff-Cross Appellant hereby certifies that:

1. The brief complies with the type-volume limitation of Federal Rule of Appellate Procedure 28.1(e)(2)(B)(i) because exclusive of the exempted portions it contains 16,498 words as counted by the word processing program used to prepare the brief; and

2. The brief complies with the typeface requirements of Federal Rule of Appellate Procedure 32(a)(5) and the type-style requirements of Federal Rule of Appellate Procedure 32(a)(6) because it has been prepared using Microsoft Office Word in a proportionally spaced typeface: Times New Roman, font size 14.

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May 11, 2015